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THE SILVER MINES

OF

COLORADO:

A FLYING TRIP,

BY

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CENTRAL CITY
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P R E F A C E

My object in the publication of these letters is to put in convenient and imperishable shape such information as they contain of the nature of the silver mines of Colorado, and their actual condition. Very little can as yet be certainly predicated of them, from the fact that exploration has only just commenced. From two hundred to three hundred tons of ore from the backs of different lodes, have been reduced, however, and the result—something more than \$100 a ton, average coin value of silver, besides a very large percentage in most cases of lead—is such as to justify great hopes. The silver district badly needs capital, for the extensive exploitation and working of its lodes, and for the building of reduction works of large capacity. A careful consideration of the facts related in these letters, will convince any candid person, I think, that a better and fresher field for the investment of capital, seldom offers. If it shall so convince any considerable number, I shall be satisfied.

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THE SILVER MINES OF COLORADO.

I.

MINING ON CLEAR CREEK.

GEORGETOWN. SEPTEMBER 11, 1867.

"Hard times," has been the one ringing cry in my ears since I reached the Territory. After a long sojourn in the East business has appeared so lively to me, however, that I have not listened to it. Coming from Central to Idaho to-day with Mr. Nott, of Bailey & Nott, livery and feed men of Georgetown, it *did* seem too much like Sabbath to be pleasant. The Alps and Pewabic works are about all that break the stillness. There is nothing new at Idaho but Sisty's bath-house. The summer guests have gone from the Bebee House, Mr. Bebee is in the East, and the folks in the hotel doze away the slow hours. The Recorder's office is thronged with a half dozen familiar faces. It is not a large apartment. We called on Montague, took a plunge in his "ocean bath," the next thing to the sea at Long Branch, and came on.

More business and more life and buoyancy of feeling soon became apparent. At the head of Hukill Gulch Mr. Thackeray is building an arastra mill for the Fairmount Company, designed to work surface quartz mined in the vicinity. Mr. C. T. Sabin has again been placed in the management of the Whale Company's affairs, and is going to carefully investigate the true character of the Whale Lode and its ores, with the view of resuming operations should such investigation seem to justify it. Where the road first crosses the creek above Idaho a few men have

been drifting on the bed-rock under the bar, getting from a half to two and a half ounces of gold dust per hand-per day all the season. Mr. DuMont, agent of the Alden Tunnel Company, is meeting with strong indications of a lode in his tunnel. It is now in about 250 feet, and within a short distance of one of the Company's lodes which out-crops heavily, and on which a shaft was sunk to a considerable depth and the ore proved to be rich. At Mill City Mr. W. A. Brown, agent of the Tiger Company, is building an arastra mill and driving a tunnel, now in 125 feet, aimed for the Virden Lode, high up on the mountain, but crossing some others meanwhile. Mr. G. B. Reed, agent of the Piasa Company, is building a mill and mining at a depth of 170 feet on the Piasa Lode. He has a crevice of average size and quality. Mr. W. R. Hawkins, agent of the Boston & Chicago Company, has driven his tunnel 353 feet, striking at that point the first of a group of parallel lodes, at least one of which, the Jersey County, is a rich vein of more than average strength. This tunnel has been excavated at a cost of \$29 per foot. Mr. Sneider is running two arasstras on quartz from the Albion Lode, realizing \$40 a ton. Messrs. Kirtland & Kinney are opening the Young America Lode, just above Downieville Bar, getting out some very rich silver ore. Mr. Kinney is building small reducing works at the foot of the lode. The discovery of the Young America, counted one of the best lodes in the county, has stimulated prospecting in the vicinity, and several lodes bearing silver and gold in about equal proportion, have been discovered.

At Empire Messrs. Mason & Wheeler are running the old Tennessee mill (24 stamps), on quartz from the Silver Mountain Lode, crushing about 60 tons a week, and realizing \$15 a ton. Messrs. Disbrow, Wheeler & Haskins are running Mr. Peck's mill (12 stamps), on quartz from the Silver Mountain Lode; 25 feet from the surface have a three-foot crevice, yields \$16, currency, per ton, mill five tons a day, two men mine the quartz, hauling one dollar per ton, three men required to run the mill, wages \$3.50 to \$4.50, cost of power, steam, \$3.50 per day. Mining, \$8, hauling, \$5, milling, and power, \$15.50, total cost, \$28.50; gross yield, five tons at \$16 per ton, \$80; profit, \$59.50. Mr. Martin is running the Knickerbocker mill (20 stamps), on quartz from the Roland or Great Cross, a great ledge of

quartz outcropping on the southern face of Silver Mountain. An open cut is being driven northward 20 to 30 feet wide, head now 50 to 60 feet high. With a large mill near by and run by water this would doubtless be a very profitable ledge. It is worth not less than \$10 a ton. They work such ledges in Australia to great profit where the quartz produces but two dwts. per ton. A good many have gone from Empire to the silver mines and other places. It is estimated that the few who stick and are at work are producing per capita \$25 in gold per day. Should this be kept up the absent will doubtless return in good time.

GEORGETOWN AND GEORGETOWN CREEK.

Where South Clear Creek forks and the road bears off up the left fork (Georgetown Creek) toward Georgetown, is the first of the future towns of the upper Vasquez silver region—Peckville—from Sergeant Peck of the Pet Lambs. Strung along the creek above like beads on a string, are Alvarado, Marshallville, Crowville, Mexico, Lower and Upper Georgetown, Brownville, Bakerville, East and West Argentine, and a half dozen Snake River towns looming up in the dim distance. One day there will be a continuous town from Idaho to Empire and Georgetown, containing anywhere from 50,000 to ten times that number of inhabitants. The adjoining hills are full of lodes, the water power unlimited, the climate salubrious, the scenery sublime, and a railroad down the creek, out of the mountains, and thence to any part of the world, easily constructed, the grade to the valley being about eighty feet to the mile.

Could George Griffith, when he "struck ile" on the hillside here above Georgetown in 1859, have foreseen what has since transpired, he might not now be a wanderer, far from this new hub of the universe. Three years ago I was here myself with pleasant companions, ruralizing, and there is not a rock along the stream, including the one that marks the spot where Miss Lander was drowned, from which we didn't throw the tempting fly to the shy trout, nor a pretty tree or grove in whose shade we didn't lounge, reading, smoking, talking, &c. There where the road crosses the creek at the lower end of the town clustered a

few white slender aspens, whispering blessing and peace to the chance passer as the zephyrs came and went, rattling like a hail storm in the stiff breeze, or listlessly turning the wrong cheek to the kiss of the warm sun. The aspens are gone. So are the thrifty young trees we could reach with our hands from the chamber window. Two citizens—Wm. Riley and W. M. Hale—and the few hands they employed, then constituted the population. A year afterward I passed through Georgetown. Silver had been discovered eight or ten miles above, but it is remembered against me that I formed a poor opinion of the new district. It drew attention, furnished a nucleus, and since then the surrounding mountains, although rising like the walls of Babel nearly half a mile heavenward, have been partially prospected, and not without success. Lodes which are known to be valuable, have been found throughout a large section—not less than one hundred square miles. Still a year later than the time last mentioned, I was through here again, and although new life had been infused into Georgetown, it gave little sign of what it has since become.

Now, in place of the scattered evergreens and great rocks that used to give such effect to the moon's white light, there are elegant residences; capacious and well regulated stores; tasty, roomy, convenient and well-kept hotels; banking houses and offices; reduction works whose wrangle never ceases; and no end to poorer structures, used as bachelors' halls or perhaps built only to hold lots. I confess to a good deal of surprise as Wells, Fargo & Co's coach rattled me through the closely built up streets where a year ago it was almost an unbroken solitude. No doubt the sudden growth of the town is speculative, unhealthy; already the lighter of the crowd are leaving for Cheyenne; but Georgetown must hereafter be a place of importance as the depot of one of the largest and richest mining districts in the world. It is bound to be the terminus of the Pacific Railroad in this direction, at least for many years, and thus it will be the source of supplies for the Snake River, Breckenridge, and Ten Mile mines, besides those immediately surrounding.

You didn't want me to write any foolishness, but I must say that this deep glen among the ancientest of hills gives the finest effect to moonlight of any place I ever saw.

The summit of the immense rock on the west is first tipped with light. This descends weirdly to you in the space of two hours; while on the east it is still "black as Erebus or old Night;" and on the south the shadow is expelled from the left and settles dark as ink in the right gorge. On three sides—east south and west—the mountains rise abruptly 1500 feet. The west mountain is gray bare rock; the south is crowned with dark evergreens. Deep gorges isolate the south from the east and west walls. What a place for the contrast of light and shade! A whole section of cloud can fling its shadow against the white face of the west mountain, and be surrounded by fields of light.

II.

THE TOWN AND PEOPLE.

GEORGETOWN, SEPTEMBER 12, 1867

To-night so many interesting topics crowd upon me that it is hard to choose. Think of your correspondent riding out to this mountain cove with the son of a man whose income amounts to \$250,000 a year, whose name is in every mouth as an artist, a discoverer, a liberal giver to charitable and educational institutions—and that son a harder worker and poorer than I am! My driver also had to entertain me with the story of his loss of a fortune, and his "don't-care-a-damn for it," since that loss was the occasion of his striking Georgetown. He said, sage that he is, that a man never *lost* anything except his health. "A sound mind in a sound body," truly Heaven contains nothing better.

Here I found cosy quarters with Col. Hall, of Geo. T. Clark & Co, and good fodder at the Barton House, perched upon and among the big boulders that form the point of Leavenworth Mountain, and overlooking the town and valley below. In one corner of the dining room is a fine Steinway piano, the keys of which Mr. Barry, a young man recently from New York, struck with the air and style of an adept, while we awaited breakfast. The tables removed, Fred. Johnson and another violinist or two called in. The room makes a pleasant dancing hall, which is somewhat suggestive. We have always known there

were good mines in this vicinity, (and by the way the Griffith, the first lode found here, which failed as a gold mine, is likely to prove a king lode yet,) and several efforts have been made to interest capitalists in their development. Who doesn't remember Will Riley with his brood of heavy companies, which started in three years ago, started and stopped? The time hadn't come. It wasn't yet to be. Suddenly, without any immediate apparent reason, everything from everywhere sets in this direction like the waves to the shore under the fierce equinoctial, and in a few months the ancient solitude is transformed into the populous and busy town, boasting all the appliances of civil life and not a few of its luxuries, and the surrounding hills are *proved* to be the country-rock of bullion-bearing veins of fabulous richness! What is that subtle force that holds back or urges men hither and thither as leaves in the wind, in speculation, in pioneering, in politics, in religion? And where in this do they differ from the sands of the desert or the waters of the sea? From Central to Georgetown is another step westward that will never be recalled. Your town is no longer the terminus of anything, and God only knows how long this will be. I have met many old acquaintances here, so disguised in garb that I hardly recognize them. Mr. Barnard, formerly of the *News*, now of the *Miner*, gave me hearty welcome, and proffer of all possible service. Dr. Wharton seems to be in the field somewhere, so that I did not see him. I found Chapin & Dennison, and Peck & Patterson, doing business in large handsome stores, whereas I left them last fall in shanties. Col. Hale still occupies his office and square in the heart of town, and feels "monarch of all he surveys" as much as of yore. "I wait," has served him admirably for a motto. The world has come to him. His house doesn't look near as large as it did, but it is as hospitable as ever. And so I might go on forever but that I am in danger of being overwhelmed with facts and statistics concerning the mines, which are of general interest, and which I must write down even as Dogberry, or as La Fontaine his verses, to get them out of my head. Tomorrow, as it is most convenient, I go with Watson up the right fork to Bakerville or West Argentine. I shall see the Brown Company's lodes, the Baker Company's mine and works, Mr. Stille's workings, and all else that is worth

seeing in that section. Thence I intend to cross over to the Snakes, where I have never been, take a good look and there, and then back by a different trail through East Argentine. Again arrived here I shall be better fit to climb the everlasting hills enclosing Georgetown valley. Meanwhile, I have seen four silver bars just from Garrott & Martine's Reduction Works, extracted from less than ten tons of undressed unselected ore from the White Lode, worth in coin, \$754.10.

REDUCTION WORKS OF GARROTT, MARTINE & CO.

These were established by an association of Colorado men after a thorough study through analysis of the character of the ores of the district. Beginning on a small scale and feeling their ground carefully as they proceeded, I have little doubt they have laid the foundation deep and solid of permanent success. They apply the well-known barrel amalgamation treatment of Europe, using a Bruckner furnace, satisfied of its superiority over the common reverberatory for roasting. They leased the mill and power of the What Cheer Company for a term of five years, expecting to protect the race and wheel pit so as to be able to run winter and summer. About the first of June they commenced operations, and up to date have been so delayed by defects in their machinery that they have run not more than fifteen days. Yet they have shipped \$3000 worth of silver. They think their works now in shape to run without further serious detention.

The treatment consists in crushing dry with stamps, roasting with salt and a certain percentage of sulphuret of iron, (gold ores) to chloridize the silver, amalgamating in barrels, retorting and running into bars. The ore is conveyed from the battery to the furnace, and from the cooling hearth to the barrels, by elevators. The furnace is a cylinder eleven feet long and five feet in diameter, made of boiler iron, lined with common brick, weighing six tons, revolving once a minute on wheels built round it, which rest on cast iron trucks. It roasts 8000 lbs., in three charges, every 24 hours, using one cord of wood, and requiring two large barrels to keep up the amalgamating. From five to twelve per cent. of the charge, according to the value of the ore, is salt, and from fifteen to twenty-

five per cent. sulphuret of iron. A larger furnace capacity would be secured by using copperas instead of the latter. Fifteen hundred pounds of quicksilver is required in each amalgamating barrel, 4000 lbs. of ore is a charge, and sixteen hours suffice for the operation, leaving eight of the 24 for charging and discharging. To reduce twenty tons a day would take thirty stamps, five cylinders and ten barrels of the above capacity. Abundance of ore is offered and the supply is likely to increase faster than the demand from present or prospective reduction works. The best testimony as to these works and their treatment is the silver turned out.* They have worked to within 94 per cent. of the assay and as low as 80 per cent. One lot of 15½ tons from the Coin assayed \$240 per ton; \$206 per ton was extracted, 86 per cent. of the assay.

GEORGETOWN SILVER SMELTING COMPANY.

The Reduction Works of Garrott, Martine & Co. do not treat ores containing more than twenty per cent. of galena. Nor could they treat to advantage ores containing more than 300 ounces of silver per ton, since about a pound of salt per ounce per ton must be roasted to chloridize the silver. For such ores a practice is at hand, however, equally as thorough and successful as far as it goes. It is the furnaces of the Georgetown Silver Smelting Company. I regard the property of this Company as one of the finest and destined to be among the most valuable in the State. It comprises, I should think, four acres of ground in the most eligible part of Georgetown for their purpose. Sheltered on the west by a mountain wall a quarter of a mile high, lying along and including the right fork for several hundred feet where it issues from its canyon into the valley, there is warmth and agreeableness in the location, abundance of water, and nearly one hundred feet head, or three separate powers, to be had on the property. The ground alone is worth more than the money so far expended. The spot, indeed the whole valley, seems to have been intended by the Great Architect for precisely the use to which it is being devoted.

*Up to the end of September they had reduced fifty-seven tons, the average yield per ton being \$110.

The creek has been dammed and a flume made, giving about thirty feet fall, sufficient for the present. There are two frame buildings on the ground, one for the crushing and dressing machinery, the other containing the furnaces for roasting, smelting, and cupelling. The latter branch of the works is equal to treating ten tons of raw ore, (five of dressed ore) per day; but the crushing and dressing machinery has not been equal, says Mr. Johnson, the agent of the Company, to preparing more than *one* ton per day, and that is why the amount of silver produced has only been \$15,000 against ten times that amount as it ought to have been. Will the dear public endeavor to console themselves with the knowledge that the fault is neither in the quantity nor quality of the ores offered. These have exceeded expectation. All that is needed to secure full success is the enlargement of the works four-fold and the employment of a man with the skill and executive ability to manage them. Ten or fifteen miles hence, northeast and southwest, and for ten miles in width, a lode has occasionally been found upon which there can be no discount, and this is but the beginning of discovery. I make no account of the thousand tip-top indications of paying lodes, although any of them is liable to develop well. Here, saving a few exceptionally favored localities, the ores must be brought for reduction. A gentleman told me to-day that he is bringing ore twelve miles at a cost of \$45 per ton, and that nevertheless he has made 25 per cent. profit, since he first struck pick in the ground. There is a good deal of ore at the works awaiting manipulation, but nothing to what there might have been had they been ready for it. Much more has never been moved from the mines. From one ton of Equator ore, \$1,323, coin value, was taken. It is to be hoped on every account that this Company will come to life and occupy its great advantages by the time another season opens. If they don't they may soon have more competition than will be agreeable. At present they amount to nothing comparatively.

III.

THE WATSON WAGON ROAD.

WEST ARGENTINE, SEPTEMBER 13, 1867.

This morning, in company with Messrs. Morse, Watson, and Darby, I started up the right fork of Clear Creek, (Watson Creek I venture to christen it) from Georgetown, on a fair wagon road. There are two short hills on the lower part of it and in places it is somewhat stony and rough, but a good team easily hauls fifteen cwt. up or down. The upper four miles must ascend, I should think, 3000 feet, yet the grade is even, a horse trots you either way. Mr. J. W. Watson, agent of the Baker and Brown S. M. Companies, constructed this road, at a cost of \$15,000, and after riding over it to this place, ten miles, I am constrained to give him credit for uncommon enterprise and courage. It is a great public work, extending our empire so much further into the recesses of the Rocky Mountains—opening to easy access a large and rich mining district. A charter for a toll-road was granted the Baker Company by the Legislature last winter, and next year toll will be exacted of travel.

THE BROWN SILVER MINING COMPANY.

About four miles above Georgetown, at the foot of a huge gorge in the north mountain carrying ten to twenty inches of water, are situate the boarding house, office, blacksmith shop, barn, &c., of the Brown S. M. Company. Here is Brown Mountain, Brown Lode, Brown Gorge, and Brown Ville. Brown himself, not John but William H., called also "Wild Bill," is here too, looking after the affairs of the Company as resident captain, but little wilder in appearance than when he rose and shone on Philadelphia last winter in all the glory of a trapper's buckskin suit, furs, fringes, beads, paint and all. About 400 yards up the sunny side of the mountain, three lodes—Coin, Brown and Mammoth—are exposed by the gorge. The Company own 1400 feet on the first, 1600 on the second, and 800 on the third. The last they have not yet opened. On the Brown an adit has been excavated west from the

gorge 80 feet, showing a vein of pure ore six or eight inches wide, which assays 370 ounces of silver to the ton, and is 40 to 60 per cent. lead. There may be twenty tons of ore at the mouth of the adit. The Coin is fifty to a hundred feet further up the hill. Fifty rods west of the gorge it is being worked by an open cut now 60 feet long and twenty to thirty deep. The mineral vein has varied in width so far from four inches to two feet. It assays 375 ounces to the ton, and is accompanied by a gouge, decomposed galena, which assays from \$450 to \$1050.* The lode is also opened in two places within 100 yards west of this main working, where it shows the same strength and produces the same quality of ore. A tunnel has been started in the left side of the gorge some distance below the two lodes, bearing northwest, now in 90 feet, will strike the Brown in course of 50 yards 130 feet from the surface, the Coin a little further on and at a greater depth. A shaft is being sunk on the Brown to intersect the tunnel and give air. There are 50 tons of galena at the working on the Coin, and 20 have been sent down to the Reduction Works. Four jacks, driven by a boy, pack down to the road 3000 lbs. per day, whence it is wagoned to Georgetown, at a cost, including mining, of \$16 a ton.

Small as is the expense of packing in this instance, it does not enter into the plan of permanent working. Mr. Watson has purchased and is laying down 1100 feet of gas pipe, 2½ inches in size at the top, gradually enlarging to four at the bottom, and descending at an angle of twenty-five degrees, through which he proposes to slide the ore from the mines into the mill, after pulverizing it with a DuBois stone breaker. The water of the gorge furnishes the power. Should the pipe clog, a blower will be brought into requisition. That failing, water will be turned in. The pipe may be uncoupled every fifty feet in case of actual stoppage. If this will work as expected, it at once unravels a serious snarl in mining on these rough high mountains. Doubtless it, or some modification of it, will be made to answer very generally. But Mr. Watson deserves a patent on the idea, although I believe he stole it from the oil men of Pennsylvania, who once talked of running their oil to New York in a pipe.

(Garrott, Martine & Co reduced 15½ tons of this gouge in September. It assayed \$240 per ton and produced \$206, coin value, through the lot.

The mill is located on the road, built in steps against the hill, and designed for two of Bruckner's furnaces; capacity, six or eight tons a day; and one set of smelting furnaces, capacity, three tons a day. Stamps will be used for crushing. The galena and gossan will be separated at the mine by a separator of a new pattern, bought for \$500 in New York. The timber and lumber for the mill are ready at Mr. Watson's saw mill, a mile or so above. All the material and machinery for the works at the mines and mill has been purchased and a good share of it is on the ground, at the cost to date of \$20,000. It remains to erect and operate it, which Mr. Watson hopes to do by next spring, and at an additional cost little exceeding that already incurred. He has \$75,000 to devote to it, and says that he shall be badly disappointed if he doesn't more than get it back in three months after starting.

OTHER LODES OF BROWN MOUNTAIN.

Cropping out at regular intervals in and west of Brown Gorge from the base to the summit of the mountain, are the Terrible, Rainbow, Mammoth, Brown, Coin, Lutz, Accident, Baxter, Edwena, Burr, Lily, Farmer, and Roe. They run with the mountain, east-and-west, are sheltered from the north winds and exposed to the sun, are accessible by wagon road, outcrop very slightly but open within 20 feet of the surface to a width of six, eight, ten, twelve, or twenty inches of argentiferous galena accompanied by two to four feet of quartzose gangue, ore and gangue bearing the same general appearance and being rich in silver.

The Terrible, which crosses Brown Gorge 200 yards from the creek, is the most improved. It has been stripped on the surface a little way, showing a four-inch vein of mineral, zinc-blende, the "black-jack" of miners, seaming the solid rock. Forty feet from the surface this vein had widened to twelve inches. Twenty feet deeper it had become 22 inches wide. The walls are regular and perpendicular and 61 inches apart at that depth. Five tons of the ore reduced by Garrott & Martine, produced \$106, currency, per-ton, which was but 52 per cent. of the assay. The ore is not easily treated by amalgamation, but without doubt better success would attend a second effort. The Terrible belongs to Messrs. Crow & Clark of Georgetown.

The Lily, about 300 yards above the Brown, has a shaft 20 feet deep and twelve long, showing on an average twelve inches of argentiferous galena, which looks better than even that of the Coin, and assays from \$500 to \$4000 per ton. It was discovered June 20, 1867. Mr. C. J. Goss has recently purchased 1400 feet west on it.

The Rainbow, Lutz, Accident, Baxter, Edwena, Burr, &c., have shafts from 20 to 30 feet deep, in which are generally developed the same characteristics as in those noticed.

About a mile east of Brown Gorge these lodes crop out again. Some of them have been discovered and named Bush, Cashier, Combs, Flora McLain, Wild Bill, and Memphis, the last 500 yards from the creek. The Smelting Works extracted 236 ounces of silver from two tons of ore from the Combs. The Flora McLain assays from \$495 to \$1770 per ton. The lodes so far as opened are similar to those of the group first above described, and so are the gangue and ores.

Brown Mountain is not without poetic suggestions. The trail winds along the brink of a precipice 100 feet high, with a cliff towering as high above. The wee pack animals climbing slowly up, stealing a pricker, twig, or spire of wiry grass, to stay their stomachs, followed by the boy driver; or feeling their way carefully down with their loads over and among the rocks, illustrate "patience on a monument smiling at grief." One crossed his legs the other day, stumbled outside the trail, rolled over the brink of the ledge and fell 100 feet. He died! With his heels to the foe, let it be said in his praise. This might be the trail of the Serpent over us all. It is a narrow though not straight path. Then the little stream dashes down the gorge, often leaping forty to sixty feet without lighting, losing itself in spray, and no doubt making little rainbows, emulative of Yosemite, when it wants to. The great blasts throwing showers of stones clear down to the creek and echoes from crag to crag; the men in the dark damp shafts and tunnels whose loose vestments expose their brawny necks, shoulders, and chests, models for the sculptor and bleached to an unearthly whiteness; and finally the opposite mountain rising into the clouds and shutting out the world, red down clinging to its bald temples, its face and sides scarred and seamed and burnt and

furrowed by all the elements for lo these millions of millions of years!

A mile or so above Brownville, the valley opens out considerably, and there was here a fine growth of forest. Mr. Watson's saw mill has cut out this season 400,000 feet of lumber and timber, 180,000 of which will be used by the Baker Company.

THE BAKER SILVER MINING COMPANY.

Eight miles above Georgetown, Quail Creek empties into Watson Creek from the south. It is five miles hence up the creek to its heads, one sucking its nutriment from the northern base of Gray's Peak, the other from the eastern, with Kelso Mountain between. Here are the Baker Company's mill, saw-mill, boarding house, &c. The mill is built in steps against the hill-side, and with sheds and engine house is nearly 100 feet square. The 100-horse engines and boilers cost the Gunnell Central G. M. Company \$16,000; Mr. Watson bought them at Sheriff's sale for \$5,000, and it cost \$300 to move them from Quartz Hill. Times are not as they were, are they? But with the success of cheap amalgamating there will be few more sales of this kind, and operators must not therefore count on them. Water power can be used to run the mill if desirable. It is designed for eight Bruckner furnaces, now just arriving from Pittsburg, their inside work already on the ground, only three of them to be put up at present, however. DuBois's rock breaker and ball grinders will be used for pulverizing. The first is an improvement on the Blake rock breaker, and a machine of half the weight and cost of the Blake, and is so constructed that if anything *must* give way as is often the case with rock breakers, for instance when drill or gad points get in with the ore, it shall be a bolt, replaced in five minutes, instead of a main casting. The ball grinders are 42 inches long by 48 in diameter, the wrought iron staves which line them lasting eight months, and the balls, four. One of these machines following the other will pulverize 20 tons of ore per day. They are made in Colorado, these at the Black Hawk Foundry. There is an ocean of wood here, 500 cords cut clear no space at all.

Hence a hard road of even grade winds up three or four

miles to the Baker Lode. It is more of a hill than from Idaho to the head of Russell Gulch, and that rises 2000 feet. Approaching timber-line, the vista of the road is closed by the northern exposure of Gray's Peak, a naked rock, holding eternal snow-drifts in its furrows and cavities, rising five times as high as the Pyramids, grander than I have words to picture. The road bends slightly eastward, and the right fork of Quail Creek with its dower of young pines fills the eye. Further on the world is reduced to Kelso Mountain, not silver plated but the immemorial treasure house of silver. At last we emerge from timber, Mt. McClellan, a rough rock wall 2000 feet high on our left sweeping gradually round to the right ahead of us and culminating in Irwin's Peak, twin brother of Gray, which is in sight, Mt. Kelso on our right. Taking advantage of the hill, a mile further brings us to a high roomy bench on which are a log block house, blacksmith shop, and landing place for the cars of the "Middle Division of the Central Pacific Railroad."

The section is 700 feet long and brings down the ore from the main working to the wagon road. The Company own 3300 feet on the lode, which stands in the eastern face of Kelso Mountain like a great tree which has been stripped by the storms of all but two or three of its principal branches. The two main ramifications, called the north and south crevices, bear S. 72° W. and S. 60° W., dipping 65° and 85° to the north. The larger crevice has been opened for 300 yards, everywhere showing a foot-wall of the same incline, smooth regular and straight as if built of masonry. The head of the open cut at discovery, supposed intersection of the two crevices, is 20 feet high and shows two feet of pay-quartz and ore. At this place there is six feet of vein-matter on the foot-wall, with an outcrop toward the other wall twenty yards wide. What proportion of this outcrop or whether any of it will go to strengthen the pay-vein at a greater depth, is of course problematical. The opinion of the best-informed man in the world would be worth little on such a point. Perhaps Mrs. Prof. Denton could tell, however. See Hepworth Dixon's book. It is safe to say that the promise is fair for a permanent lode of mineral worth \$100 a ton, five to ten feet in width. The great lode of Freiburg is but seven feet wide, and the average yield of the 3000 silver mines

of Mexico at the date of Humboldt's visit was $1\frac{1}{2}$ ounces per cwt. The plan of opening and working the lode is by adits at intervals of ten fathoms, three of which are already started.*

There must be 1500 feet in depth of the lode, from its peculiar location, that can be mined above the surface, so to speak, thus dispensing for a number of years with the costly hoisting and pumping machinery commonly required in heavy mining. The value of these advantages in the inauguration of such an enterprise, is simply incalculable. Some idea may be had of it by considering that it is even better than as though a shaft had been sunk on the lode to a depth of 1500 feet, for in that case hoisting and pumping could not be avoided, and it should be remembered that the average mines of the world have not paid to work much beyond that depth, unless so situated that it could be done by tunnels, because the expense of hoisting ore and water so far consumed the entire profit. So that this great lode-ground above the surface is clear gain.

You may be surprised to hear that this ore is mined and delivered in Georgetown for \$12 a ton. Corn and hay

*On the 1st of October the mill had been raised and enclosed, and the engines boilers and other machinery were being set up. The upper adit had been driven 80 feet, the first and second below, each 30, their mouths timbered and housed in for winter work, and winter supplies for mining living and warming hauled up to the block-house at the mine. Preparations for a vigorous winter campaign on the lode had been completed. The three adits were being pushed in by day and night shifts. Sixty to seventy tons of ore from the lode had been hauled down to Martino's mill, which had commenced running on it. One and a half tons, carefully selected, had produced \$524.65 worth of silver, which had gone on to the Company. The policy of building so large a mill or any mill before opening the lode, may perhaps be questioned. We have seen so many such enterprises fail in Gilpin County that some anxiety or doubt is quite excusable. It is not here as it was with us in 1864, however. The Baker Company are obliged to pioneer it in every respect. They have had to explore and build roads twelve miles ahead, and that in no pleasure grounds. There were no reduction works at hand except two experimental concerns at Georgetown, twelve miles from the Baker Lode, always overrun with custom work. The Company knew they had \$100 or \$200 ores, and that they could be reduced between smelting and amalgamating as already established and in operation at Georgetown. More, if their own lode would not supply their mill they were in the midst of a district full of rich lodes that was not likely to have any other dependence for reducing ores for sometime. Under such circumstances they had but one course to pursue—to put up reduction works on a large scale. Unlike our district in 1864, which had then more than 100 stamp mills, this district had not one, and this will be its first mill worthy of the name. There can be no risk in it saving the risk attending all betting on what is in the ground. Had it been left to Mr. Watson it would have been reducing ores by this time. But the Company's Eastern officers contracted with other persons for the building of the mill, and those parties seem to have had a good deal of their own business to attend to. So that it is perhaps certain the mill will do nothing till next season. I regard the entire operations of the Company as an instance of surprising enterprise and courage, even for this country where the display of those qualities is not uncommon. And I have full confidence in their success.

are contracted for in the Valley by the quantity to be delivered at Georgetown, for six and three cents. Flour is bought in the same way for from nine to eleven dollars. Beef cattle are purchased by the drove so that the meat used costs no more than ten cents. The Company board all of their fifty or sixty hands, wages for laborers being \$2.25 per diem, with board—about as cheap as labor can be expected. A mule team, including driver's keep and wages, costs seven dollars a day, and takes down thirty cwt. to a load, making two trips in three days, (one ton per team per day) and bringing back whatever is needed at this end in light loads. They have five first-class teams.

Mr. Watson expects to have everything running and making money by next July. If he continues as he has begun he doubtless will. In view of the very late spring of 1867, and numerous other drawbacks sufficient to discourage most men, it is astonishing that so much has been accomplished. Standing at the Baker ore depot as I did to-day, with nothing but cloud-compelling masses of primitive rock and the sky in sight, man seemed very small. Yet what a soul has he to thus attempt, as it were, to circumvent God! That is to say, to abolish heat and cold, height and depth, to accomplish impossibilities, to ignore physical law. What capacity of faith and hope and courage is not here exhibited? May grand old Kelso Mountain, as he emerged from darkness to light, or rather as darkness slunk away from his shaggy sides at the bidding of fair Luna, now in the plenitude of her monthly power, symbolize the near and perfect fruition of his and our hopes.

IV.

LIFE IN THE MOUNTAINS.

WEST ARGENTINE, SEPTEMBER 13, 1867.

"Ye crags and peaks, I'm with you once again!
I hold my hands to you, as if I would
Embrace you!"

So long absent from the higher haunts of the mountains, I had almost come to think the peculiar charm attributed to them by their lovers chiefly due to an exuberant and willing fancy. But it is not so. High life is

really a luxury. No wonder the heathen made the mountain tops sacrificial altars. In this they may have raged a few, but they did not imagine a vain thing. There is a sparkle and exhilaration in the air which mocks the universal mocker—wine. Had I not felt it myself all day and yesterday, I should have been made aware of it by Morse's remorseless puns which were perpetrated without a morsel of provocation, by the vivacious freshness of Darby's Irishisms, and the dry pungency of Watson's wit. It put me in an unprincipled mood, and I reflected cynically on the base uses, not to which we must come at last, namely, to be food for worms, but to which we are reduced at present, have been, are, and shall be, so much the worse for us. Think of my delicate patent leathers, made to order in Philadelphia for the purpose of playing croquet, and possibly to gratify an eye for shape while the wearer was smoking, tearing up and down these terrific rocks to the Coin, the Baker, the Linden, the Ayres, and about to try and pick a daintier way over the bald crown of the world than other mortals are privileged to tread. What for? How do I know? How do you put on paper a shrug of the shoulders? Umph! Is that pretty near it? Well, that answers my question then. And Mr. Watson, he's nothing but a poor blind worm of the dust, too, grubbing, grubbing, for a season, perhaps, "hunting the mountains o'er in vein for ore," as Morse permitted himself to say, and then crawling away out of sight.

I am stopping at the Kelso House, where I suppose lovely woman is as rare as angels' visits since Paradise, yet where they live better than at any of your town hotels. With the taste of one of Todd's doughnuts lingering in my mouth, I insist that a man or woman only needs to breathe this light pure air, eat the roasts and biscuits, the pies and cakes, and drink the Java elixir of the Kelso House to become as a god, knowing no difference between good and evil. Speaking so to Mr. Stille, the urbane proprietor of the House, this morning, he said that in July last, before the road was made, he started with a company of men to come up. They were in the rain twelve days, soaked as completely as they could be, yet none of them experienced the least ill-health in consequence. Such being the case, and all of us dead broke, I doubt not it was pleasanter sitting on saw horses last evening, watching the moon rise,

smoking clay pipes and talking mines, than it would have been to be sucking rum punches or catawba cobbles through a straw at the St. Nicholas, or mingling in the jargon of the evening exchange at the Fifth Avenue, puffing genuine Havanas and inventing schemes to separate the unwary and their cash. Not much of importance except that already detailed, has been done in this district, except by

THE SONORA SILVER MINING COMPANY.

Some persons in Central City associated themselves in 1865 for the purpose of discovering and pre-empting mining and other property here. They found thirteen lodes on Kelso and McClellan, and gave something more than a half interest in them to Philadelphia men in consideration of the latter's putting some \$40,000 into them in the way of development. Those upon which work has been done are the Tunnel, the Watson, the Ayres. The Tunnel is on Kelso, runs parallel with and about one hundred rods north of the Baker. Like the Baker it is a large ledge seamed with silver blossom, and standing above the surface for 200 yards. They are now sinking a shaft on the heaviest seam, intending, after making considerable depth, to cross-cut and prospect the ledge. They expect to find these tiny veins centering in an artery down below that will pay to work. The Watson, on McClellan, has been exploited by adit one hundred feet, the vein too pinched as yet to be available. Work ceased on it because it is an object to find paying ores as soon as possible, and it was not developing as expected. The Ayres on McClellan, has been exploited by a zig-zag adit, or what was meant for an adit, 160 feet. It was chiefly done under the direction of Rothpletz, a gentleman who wore spectacles and carried a bible in's pocket as ostentatiously as a Julesburgher does a cannon on his hip. The Company have at last found him out, and as a consequence, after much trouble, bought him out. He knew nothing about mining nor anything else, and having stipulated in the negotiation with the capitalists that he should be retained as mine captain, has been able to retard operations, waste money, and annoy the Company, to the great damage of all concerned. The adit starts in at the upper edge of

the immense mass of loose stones, fallen from above, which lies against the base of McClellan, reaching far up its side and far out into the valley of Quail Creek. It is along and a little above this level most of the lodes on the western face of the mountain have been discovered and are worked. A wooden railway, 200 to 400 yards in length, would land the ore in the grassy valley from most of the shafts. The Ayres has not proved as good in the adit as was expected from its appearance, eight to twelve inches wide, seaming the perpendicular face of the cliff for two hundred feet above the adit. But the indications are now regarded by Mr. Geo. Stille, the agent of the Company, and Mr. James Kelso, mine captain, as more favorable than ever before. The truth is, the adit was not started on the lode, but on a bastard vein of carbonate of lime, running alongside and regarded as a kind of feeder. I think it doubtful whether it is yet on the lode, although from its windings I could form no very clear idea of *where* it is. Mr. Stille thinks the Ayres has all the characteristics of a true fissure vein, smooth solid walls, the right direction and dip, and although not fully satisfied, feels encouraged to go on.

He had Captain Rule as a guest for a few days last season and after looking the district over pretty thoroughly, Rule remarked, that if he did not *know* it to be in the United States, he should think it to be among the richest of the silver districts of Mexico, where he spent many years, so much does it resemble them in its general features. Its great altitude, rendering it liable to heavy snows and tempestuous weather half the year, may be regarded by some as a serious drawback, but its difficulties of climate are nothing to what have been overcome in other parts of the world. Given, paying ore, and the rest will take care of itself. For what is impossible that will pay? Last winter a dozen men lived here, and lost but two days' work. Their provisions were brought up in the fall, and communication was only kept up between them and a sinful world by means of snowshoes. A road was kept open to Watson's saw mill, five miles above Georgetown, and no doubt might have been to this place had it been necessary, and last was the meanest winter of a thousand and altogether lovely—to the storm spirit.

Stille's Company have a fine water power and mill-site here, 11,000 feet above sea, with fuel for several years at

hand. No reducing works will be constructed, however, until a workable body of ore of a fixed character shall have been found. Sagacious. For the Company's lodes not herein specially mentioned, they are merely struck, but are regarded as of good promise.

OTHER LODES AND WORKINGS OF WEST ARGENTINE.

Among these perhaps the most important are those of Col. Chas. P. Baldwin of Cincinnati. He is mining a lode called the Huldah, near the Baker, and so near as to seem to me very possibly to be a spur of that lode. He has excavated an adit, some forty feet long, has a good solid foot wall but not much mineral. It is on both sides, ahead and behind him, although in rather small seams. The only way to find it in practicable quantity is to hunt and sink. Perhaps fifty rods north of this, he has another lode, the Proteus, which looks better than the Huldah. Twenty feet from the surface, it is nearly a foot wide, and a few hundred pounds of the ore reduced at Georgetown produced a handsome button of bullion.

The best show I have seen for a king lode on McClellan, one that shall really be a good thing, is the Linden, discovered by James Thomas and Charles Bishop, June 21st, 1865. The discovery is at the upper edge of the debris before spoken of. On the surface the main crevice runs with the strata, which stands in tremendous flakes, leaning just enough toward the comb of the mountain to remain standing. Between these loose ragged strata, veins of mineral occur, as if forced up from below, and scattering like the debris of a volcano as they neared the surface where resistance was less. Gorges a hundred feet deep have been worn down the face of the mountain across these strata, and in these, where many mineral veins have concentrated in one, as is plainly to be seen, most of the lodes on this face of McClellan have been struck. From the appearance of these scattered mineral veins, in the great edged-up strata of rock between the gorges, narrowing in many instances from one hundred to ten feet in the vertical space exposed to view, it would seem that depth is all they need to make them workable. Not that, struck in favorable places, some of the best of them do not pay from beginning. Prof. Dibben is working one which he

says has paid twenty-five per cent. profit from the start. He has a six-inch crevice of argentiferous galena, assaying \$200, silver, per ton, and sixty per cent. lead. Five or six tons are lying at the mouth of his open adit, and the Georgetown Smelting Company are treating five tons of it, giving him the assay value in coin, he paying them their price for reducing, \$50 a ton. As regards the main seam of the Linden, from a favorable look-out it may be traced by the eye, its yellow crevice five to ten feet wide, cutting its way through and over everything for two thousand feet. At discovery, the galena vein is eight inches thick, and is visible in either side of the gorge twenty feet upward. Thirty cwt. of the ore was taken down to Ford & Danforth's works in Russell in 1865, but their Company bursted and no returns could be got by the owners. They are now going to get out five or ten tons and have it reduced at Georgetown, Mr. Watson having concluded to take hold of it. The Linden is head and shoulders above all other lodes I have seen on McClellan, just as the Baker is above those of Kelso.

I hear of other lodes being opened on McClellan. The owners of the Linden are mining a lode higher up, called the Summit, which shows a fair vein of argentiferous galena. Messrs. Pine and Slawson and James Martin have a lode in the same vicinity, called the Jackson, said to show eighteen inches of rich galena. The Democrat, not far above the Linden, discovered and being opened by Chas. McKinney, Felix Riopell, and Peter Mack, has an eight-inch vein of argentiferous galena which appears in the face of the mountain 100 feet upward. It can be traced on the surface two hundred yards. They are getting out some ore to have treated at Georgetown.

Col. O. C. Scoville, of Cleveland, Ohio, has a lode called General Fitch, on the rocky face of McClellan, looking toward the Baker. Ten feet from the surface the walls are five feet apart, the mineral crevice twelve inches wide, assays \$1,344 per ton. Ten pounds of the ore yielded five ounces of silver.

Thus I have given you in detail what is doing on the right fork. It may be dull reading to outsiders, but Coloradoans and men interested in Colorado, must be pleased with the report of so many and great obstacles overcome, with the work doing, with the fair prospects for the future.

Besides, it is well to have the information on record. The journal with sufficient enterprise to so put it deserves the gratitude of a public whose eternal as well as temporal interests appear to depend on the success of mining.

V.

CHIHUAHUA.

CHIHUAHUA, COI., SEPTEMBER 17, 1897

It is Sunday with you I suppose. I haven't kept the day holy in the usual acceptance of the term, but it has been observed so long in these altitudinous solitudes that I venture to draw on the past in this regard. Do you know where Chihuahua is or of what it consists? It is Dick Irwin's camp, situate in Colfax Park, a sunny grass-plat of considerable area on Chihuahua Gulch, one of the uppermost affluents of the Snake. It is just at timber-line "over the Range," and is reached by a trail leading over the summit of Irwin's Peak.

Irwin is one of a tribe of pioneer prospectors which has superseded the old-time Rocky Mountain trapper. No pent up Utica answers for this energetic independent hardy class of our people. This morning as I was leaving Quail Creek and commencing the ascent of Irwin's Peak. I saw a Lilliputian animal with a still slighter one attached by the tail emerging from the clouds that crowned the summit. It was Irwin's horse and Irwin. I found out afterward, coming over the Range to engage some Mexican packers to carry right over this peak to West Argentine twenty-five tons of ore. To him this terrible barrier is nothing. Indeed he has made a fair trail and contemplates building a road over it, at a cost of seven dollars a rod for a thousand rods! He is only in doubt whether to do this, or to continue one on from the Baker Company's mill at the mouth of Quail up Watson's Creek and Grizzly Gulch through Grizzly Pass and down the North Snake. This route has an easy grade on either side, and the pass is little above timber-line. The road would be about ten miles long and easily constructed.

It is of great importance to both sides that a good route for a road between the two districts be found. This side

would be more easily supplied from Georgetown, and the Clear Creek silver mines need a direct communication with the salt springs of the Middle and South Parks. Mr. Watson has contracted with Rollins & Co. to deliver this season at Georgetown fifty tons of salt at \$140 a ton. If it can be furnished and brought from the Colorado Salt Works over the hard circuitous route now in use between the two places for seven cents, it might be furnished and brought directly from the great springs on the Grand River for three or four.

These were my thoughts as I toiled up the steep ascent. Not very poetic, were they? But I haven't so much poetry "into" me now as I had last year. It don't pay much. Nevertheless I thought a good deal of a snow drift on my right which must have been there since ever snow fell on the world. Think of that! I should have gone and got some but that I knew it would dispel the illusion. It and the snow would have melted in my grasp.

"We gather shells from youth to age,
And then we leave them like a child."

By the way have any of your folks missed their grasshoppers? Because, if they have, I can tell them where they may recover them. They are up here, I suppose to consummate their amours without molestation and then die like the rest of us. That is what they are doing. The way they die is to bat their heads against the rocks and shingle of the Range until they beat their idiotic brains out. "The ruling passion strong in death" impelling them, however, they keep on jumping in your face as though nothing had happened. After a while their legs get broken and worn off on the sharp corners of the stones, and then they fold their gossamer wings neatly along where their puissant thighs should be but aren't, "and lie down to pleasant dreams." Grasshoppers make pretty little fragmentary funerals at last. So that they do not live in vain, the pests!

IRWIN'S PEAK.

I believe that if people could see the whole of this hill from the sweet valley below, never a one would attempt to climb it. It is indeed a wearying of the flesh. Yet the hardy miners of West Argentine, after solemnly

wearing away rock all day and playing poker for tobacco all night, often observe the Sabbath by ascending it. The summit is a grand high-place. Have you observed how the horizon enlarged whenever you paused to get breath—and cold? Then you are not overpowered, standing at last on a look-out not much larger than a government hayrick, and sweeping a horizon five hundred miles in extent! Long's Peak, gray and clear-cut against the blue sky, bounds your vision on the north. Thence a chain of mountains, colored as if by moonlight, bears westward and southward, softening the least in the world where the Grand escapes from the Middle Park. In the haze of the far northwest, Whiteley's Peak and the snow-caps of the Rabbit-Ear Range are barely distinguishable. West-south-west, you see what no language can describe. Imagine ten thousand square miles of the earth's crust heaved up three miles through an arctic ocean of ice and snow. This ocean with its mountainous icebergs swashes hither and thither and is at last shed off, tearing out vast channels in every direction, leaving the upheaval a "confusion worse confounded" of rock ridges, walls, cones, and cliffs, towers sturdily invading the sky, and broken craters of drowned volcanoes, with great masses of ice and wreaths of snow clinging eternally to their unhewn sides! This is how it must have been done I fancy. There are no soft colors in the picture. The white snow and black rocks sharply contrast. It is desolation crowned by winter. Are you tired of it? Then drop and rest your eyes where the Blue and its tributaries lose themselves between grassy dells and dense forests of their own creation. Now sweep the southern horizon which rests upon Fort Garland—which includes Mt. Lincoln and his brother Titans assembled forever at the head of South Park in solemn conclave, and the South Park itself with its low wooded hills and golden openings stretching away like a noble pleasure ground to the purple ridges that enclose it on the south and east, and which culminate in Pike's Peak. Thence to Long's Peak the Plains spread out their yellow expanse, relieved by an occasional stream with its dower of trees, banking up toward the east like the sea until they are lost in the smoky sky, speaking to you of a land beyond, rich in life and life's memories.

But it is cold. There are no grasshoppers here, no

sound but the hollow rumble or sharp whistle of the wind. Your comrades have gone down the western slope, leading the shivering animals. Shall we leave our cards in the little fort and follow, or are we not sufficiently humbled?

A mile north of us is Gray's Peak, a little higher than we are judging by the eye. It was named in 1862 by Dr. C. C. Parry, of Davenport, Ia., in honor of Prof. Gray of Philadelphia. According to his measurement it is 14,300 feet high, 35 feet higher than Pike's Peak. It is one of the loftiest mountains of North America, and a buggy may be driven to within two miles of its summit on the eastern slope, whence it would be possible for a hard-hearted person to ride horse-back to the top.

LODES OF CHIHUAHUA.

Half way down the western slope, which is smooth and covered with loose fine shingle, we come to one of Irwin's lodes—the Honor. It has a shaft twenty feet deep, exposing a seven-foot crevice of gossan which assays \$260 a ton. At the immediate base of the hill occurs the Chihuahua Lode, opened for a thousand feet, having one shaft twenty five feet deep, exposing a five-foot crevice of gossan, including eighteen inches of argentiferous galena, of which ten to twenty tons have been mined. It assays about the same as the Honor. It is this ore Irwin is going to pack over the peak and take to Georgetown for reduction. Never despair of Colorado while she retains such citizens.

A PROSPECTOR'S CAMP.

Which reminds me of something I was going to say a while ago. It was about the class of prospectors who are superseding the genus trapper. You meet them in rough log cabins as near the top of the Range as they can get and have wood and water. Men who have explored the Rocky Mountains from the San Juan to the Blackfoot—who have washed the sands of the Missouri and Columbia, the Colorado and Del Norte, the Arkansas and Platte with their own hands. They work and get a little money, then go prospecting. Not that they expect to find anything

worth while, but they can't help it. Most of them say they would hunt round Central if they really cared to find something good. Indeed, pinned down, they admit that they have a little property *there* which they expect will make them rich eventually. Meanwhile, what a free wild fascinating life they live, roaming often where feet of white man never trod before! Let one of them "raise the wind," and he goes as far away from everybody else as he can and sets up for himself. Perhaps he loads ten or twenty teams with traps, crosses the Range in winter and establishes a ranch in the midst of hostile indians, fighting them off for years as Wicked Godfrey has done. What a pity by the way, that the brave old man must soon destroy his buildings which have cost him \$5,000, and abandon his place to the indians! The south side of the Platte, along by Ft. Wicked, is the best stock-growing district in northern Colorado. The snows are lighter and the temperature milder than either above or below. Mr. Godfrey told me that in the six winters he had spent there he had seldom fed his stock at all. Yet perhaps safety on the Plains will be cheaply purchased by giving up this section to the indians, which is doing as fast as the railroad progresses.

But I am writing in the cabin of one of my prospectors. It is of good size, roofed with bark, windowless and floorless, and the better part of one end cut out for a door. Along one side on the ground, with logs for head, feet and side-boards, four men lodge nights feet to feet. Pine boughs and a buffalo robe constitute the mattress, and three or four pair of heavy blankets the covering. Above this is another double bunk of the same size and style, only it rests on poles instead of the ground. May be somebody thinks that men can't sleep well in such places. Let him come here and try it and he will give it up. Facing the door hole is a large cooking stove, and behind it on nails and split-log shelves, is the paraphernalia of the cuisine. Black Tom is cook, and a better dinner than he gave me to-day, I never want. A split log with the inner sides upward, built into the house opposite the bunks, answers for a dining table, and another half-log resting on the stumps of what were trees does well for a seat at table. Above this a rough slab performs duty as a bookshelf and what-not. On one of these I found, beside several late

papers, Plutarch, Macauley, Ik. Marvel, Thackeray, Dickens—and—no!—yes?—Hollister. See what it is to be the author of a book—what good company one gets into! Wooden blocks for candlesticks, large limbs of trees with limb-legs for seats, a log shanty with fire place in the corner for lounging, another for store house and blacksmith shop, a cabinet of ores artistically arranged on a huge slab outside the door, riding saddles and pack saddles and spurs, mules and ponies, and the world shut out by an all but impassable barrier—such is the place where your correspondent hangs out on this Sabbath eve, his host as hospitable withal as a very Arab.

Nor is the occupation of this class likely soon to resemble Othello's. Vast areas of Colorado are as yet unknown and unsettled. There is an empire for these men this ten years between Long's Peak and Mt. Lincoln. Then there is the immense beyond, north and south and west and especially south.

VI.

SOUTH SNAKE RIVER.

MONTEZUMA, SEPTEMBER 16, 1887

This morning Mr. Joseph Irwin, who treated me like a king while at his "camp," accompanied me down from Colfax Park to the Snake, in which I wet my feet for the first time—by proxy. On the head of this stream is Peru District, but of that as I return. We continued down the creek to the mouth of South Snake, up which a wagon road leads to Montezuma. This fork of the Snake is eight miles long, and has two tributaries on the right—Bear and Deer creeks, each about three miles long. The mountain on the left is called Collier, that on the right as far up as Bear Creek, Lynch. Between Bear and Deer creeks lies Glacier Mountain, and between Deer and the main creek, shutting up the valley as Leavenworth Mountain does Georgetown Valley, is Teller Mountain.

MONTEZUMA.

At the mouth of Bear Creek a mile up the Snake we

come upon the spacious smooth grassy site of Montezuma. It was located and named in July 1865, by Messrs. Lynch, Teller, Collier and Van Deren.

Some fences and buildings are in process of erection here. Dr. French, whilom of Colorado City, is nearly ready to open the Montezuma House. Mr. Webster is running a saw mill, making agreeable music and fair lumber. Dr. King is building a large handsome frame house with his own hands. A saloon and billiard hall is in embryo. It shows life at least.

Montezuma is about eighteen miles from Georgetown by trail, either *via* East or West Argentine, and twenty from Breckenridge by wagon road. The fall of snow here, chiefly in the first five months of the year, is probably not far from thirty feet, but it never lays more than five or six feet in depth at once except in gorges where it is deposited by the winds. The cold is severe though not excessive. It is not windy as at your place. Men worked on the lodes here last winter without difficulty. Tested by boiling water, Montezuma suffers about the same altitude as Idaho.

Let me say *par* parenthesis that the fall of snow on Lake Superior is between thirty and forty feet per winter. It usually lies six feet deep on the level through more than half of the year, and yet the heaviest work is done in the mines there *on* this snow, and not the least trouble is found in running mills and machinery the year round.

THE SUKEY LODE S. M. CO.

Glacier Mountain, sheltering Montezuma on the west, rises to the hight of 2120 feet above the creek. His sides and toe are covered with heavy timber, his heel is bare, and he is full of mineral veins. The best-appearing of these is the Sukey, discovered by Mr. J. T. Lynch, July 22, 1864, now owned and worked by "The Sukey Lode Silver Mining Company." The outcrop is tremendous—like that of the Gregory on No. Six. Its course is S. 20° W. It is easily traced from the base to the top of the mountain, 3000 feet, surface measurement, and it is uncovered by slight cuts for half that distance. The discovery shaft is 450 feet from the base and is forty feet deep, exposing a vein of solid pure galena, forty inches in

width, which Mr. Lynch says assays from \$105 to \$280 per ton.

A modified Kustel furnace was built last year, and the reduction of a few charges of the ore attempted. Some lead riches was got, which assayed \$500 a ton. The experiment failed for want of ore dressing machinery.

The gangue-rock of this district is chiefly quartz and baryta, and the ores contain zinc, sulphate of baryta, iron pyrites, copper pyrites, carbonate of iron, associated with carbonate of manganese, gray copper, antimony, galena, and other metals, their sulphates, phosphates, carbonates, &c. The action of Collom's separator is based on the difference in the weight of metals. The specific gravity of carbonate of iron being 3.75, of zinc 4, of copper pyrites 4.14, of sulphate of baryta 4 $\frac{1}{2}$, of iron pyrites 3, and of galena 7 $\frac{1}{2}$, it will be seen that the galena of the veins may be easily separated from the other metals. Carbonate of manganese is an oxyd, one equivalent of manganese, one of oxygen, one of carbonic acid. It occurs in the gangue-rock of this part of the world in connection with carbonate of iron. Upon exposure to the atmosphere it decomposes, takes on a higher state of oxydation, becoming a per oxyd, and black in color. This is what makes so much of our blossom-rock look as though it had been burnt. There never was any fire near it.

It has been said that sulphate of baryta in the Snake River ores makes them difficult of treatment. Not if it can be readily taken out. Collom's separator will do it, and a double machine, which dresses fifteen tons of ore a day, is furnished by Mr. Collom for \$1000. His separators have superseded all others in the Lake Superior mines.

It was for the want of ore-dressing machinery that Mr. Lynch failed in smelting. He has a good furnace, which will eventually be of use without doubt. A tunnel has been driven, near but not on the lode, 190 feet. Continued as much further, it will be under discovery shaft, 256 feet from the surface. The lode underlies considerably, and the "slide" is deep, which explains the miscalculation in the location of the tunnel, which was meant to be an adit. It cannot now be far from the lode. Nine hands will be employed on the work the coming winter. The Company own 3000 feet on the lode, and if it is not good property there certainly is none in this region. To all appearance it

is a king lode, running through Glacier, and how much further only time can prove. It is supposed to have been again struck on Collier, opposite, where it is called Monte Christo.

OTHER LODES OF MONTEZUMA.

The Monte Christo was discovered July 24, 1866, by Black, Milner, and others. I found them opening it by a cut. They had stripped it twenty feet in length exposing a two-foot crevice, half of it galena quite free from gangue.

The mass of the so-called discoveries must be content with bare mention in these letters, as I can only hope to see and particularize on lodes that are being opened. The reader will get an idea of all from the description of a few.

This afternoon I have seen the Silver Wing, Black Ore, Harrisburg, Washington, Register, and Anna lodes on Glacier; the North Star, Monte Christo, Umpire, and Cooper on Collier.

The gangue of the North Star, heavy spar, stands above the surface two feet in width for a long distance. It is accompanied by a huge ledge of black blossom, never a stroke has been struck on it, yet I am told the moss-covered croppings assay from \$200 to \$500 a ton. It is too bad that such things by the dozen should lie year after year unimproved. I believe this will be one of the famous mines of the future.

The Harrisburg was discovered in December, 1860, by Pratt & Gorham. They left it, and in the autumn of 1863 Burr & Co. of Breckenridge took it up and now hold it, unquestioned. The apparent walls of the lode are twenty-seven feet apart. Between them are three veins of galena, six, thirteen, and twenty-two inches wide, respectively. There are two shafts on it, 500 feet apart, each ten feet deep.

The Washington is a ledge rather than a lode. Pieces of quartz, more or less mixed with galena, half as large as a miner's cabin, have rolled and slid from it to the valley. The Black Ore has a shaft ten feet deep, four-foot crevice, ten inches of galena, assays \$90 a ton. The Register shows a foot of galena—but slightly improved. The Anna looks much the same as the Register. The Cooper, near the base of Collier, has been struck once in three or four rods

for 200 yards. In every cut it shows a solid vein of nearly pure galena twelve to eighteen inches wide. The Umpire, is like the Cooper. It was discovered by Sharratt & Morrow, July 18, 1866. In one place it is stripped twenty feet in length, and shows fifteen inches of galena.

On Teller Mountain I hear are some strong rich lodes, but as no one is at work on them, and there is consequently little to be seen but the outcrop, I shall not go there.

In conclusion, I may be permitted to say I like the district. Nowhere have I seen stronger lodes—lodes of greater width and length, or that, so far as they have been opened, show more of the characteristics of the true fissure vein. The location is fine for the Snowy Range. The altitude is full 2000 feet below timber-line. There is plenty of room for mills and dwellings. There is abundance of timber, and unfailing water, though not enough of the latter to make first-class powers. All that seems to be needed is good roads to the world outside. There is one via Breckenridge and Hamilton to Denver, 110 miles. It is believed that they can be built from East or West Argentine, from the Baker Company's mill via Clear Creek and North Snake, and from the Platte at Hepburn's.

I think certain wealthy men who are largely interested here might take more interest in this matter with advantage to themselves and the country at large. They are public characters and aspire to continue to be. Let them take the lead in something besides politics. I know of no way in which the same investment would return so much enduring popularity as in the opening of these mines by good roads. Built on some route and at some rate, reduction works would be brought in, the ores tested, and capital secured to make the region productive. Now it has been proved at Georgetown that it will pay, there should be no more time lost.

VII.

THE BOSTON S. M. ASSOCIATION.

SAN JUAN. BEAR CREEK, SEPTEMBER 17, 1867.

Riding up Bear Creek a mile or so from Montezuma early this morning, the half-dozen cabins and saw-mill which at present constitute the settlement called San Juan, gradually grew on my vision from among the trees, as yet far more numerous than streets, mills, or dwellings. Mr. John Collom, agent for the Boston Silver Mining Association, most agreeably met me and explained the idea of his reducing works.

From the experiment of Mr. Caleb Stowell at Georgetown last year with the American Hearth, he is satisfied that it will answer for the reduction of argentiferous galena, that metal having first been thoroughly separated from all others and from the gangue rock, and the proper skill secured for the management of the business. The process is comparatively cheap. The hearths, Colorado manufacture, cost \$300 each. A McKinsie blower, weighing 4000 lbs., is worth in the States, \$800. It requires at the outside a five-horse power, and answers for six hearths. One Dodge crusher, cost in the States, \$500, a double Collom separator, \$1000, and a slag and cupel furnace complete the apparatus. Freight from Central round through Breckenridge is five cents a pound at present; from the States hither, it ought not to be more than ten. There are the boiler and engine, the building and the cost of erection. One hearth, working six men in eight-hour shifts of two each, will run out two to three tons of lead per day. From these data, any one can calculate the expense of a mill of fifteen tons a day capacity. Mr. Collom has his mill frame up, engines and boilers set, saw and shingle cutter running, and to-day commenced enclosing the whole. Next week he will build a frame dwelling house. The hearths, blower, &c., are just arriving. He hopes to get in operation yet this season. He intends to ship his lead riches East for cupellation, and will continue work through the winter.*

*On the first of November the six hearths were ready to run. One of them had been started and 500 lbs. of lead produced

The Company have several lodes in the vicinity. The one most valued is the Comstock, discovered by J. W. Dripps, July 7, 1865. It is situate on the northwestern face of Glacier, 500 yards above the creek, the hill rising at an angle of thirty degrees. It has been struck for 200 yards, everywhere showing a vein of galena twelve inches in width, containing considerable gray copper (where decomposed, a green carbonate) which is very rich in silver. Ten pounds of ore was smelted in a crucible, producing silver at the rate of \$250 a ton. A larger test proved about two-thirds as rich. It is expected to work up to \$100 a ton. A tunnel, 85 feet long, cutting the vein 55 feet from the surface, will soon be completed. From the mouth of the tunnel a plank chute will slide the ore down 1200 feet, whence a wagon road runs to the mill. One other of the Company's lodes, called Prima, discovered by Mr. Collom, Sept. 2, 1865, is very large and contains ruby ore. Nothing has been done on it. Mr. Collom's Company consists of some of the strongest men of the old Bay State Company. They have good pluck and plenty of money.

? POTOSI SILVER MINING COMPANY.

This is an organization not yet quite completed, for which Mr. John Slawson is agent. It has 800 feet on the Potosi, 1600 on the San Juan, extension west of the Potosi, 1200 on the H. W. Hill, and a water power on Bear Creek 900 feet long. The Potosi crops out along the face of the mountain, 300 yards, surface measurement, above the creek, for half a mile. The outcrop in one place is twenty feet wide, quartz, baryta, gneiss, and a little galena. The veins of crevice matter range from four inches to four feet in width. The surface workings to definitely determine the size and whereabouts of the lode, are quite extensive. Some quartz and ore have been procured from the scattered crevice, between Mr. Slawson and Guibor & Co., who own the east half of the lode, and sent to Georgetown for reduction. Mr. Slawson thinks it will work up to \$100 a ton, and that he will have a large vein of mineral. As Mr. Collom brought me down the hill and committed me to Mr. Slawson's tender mercies, he was measuring and leveling up for a tunnel. He found

that, starting at a convenient point below, it would be 240 feet long and cut the vein 225 feet from the surface. He is going to begin at once, and means to have it done by next July. Then it will be possible to form some definite idea of the lode. Now it is not, except that the outcrop is very heavy and the gossan rich. The Potosi was discovered June 26, 1865, by Martin, Hill & Dailey.

OTHER LODES OF BEAR CREEK.

From the Potosi I went with Mr. Slawson up over the summit of Glacier, passing, near the brow, the Ben Darrah, discovered July 21, 1865. Its outcrop is heavy for a little way, baryta, carrying considerable galena, much decomposed.

From this point we observed that Bear Creek does not head in one of those abrupt "horse-shoes," which might well be taken for segments of volcanic craters but for the character of the rock, so common on both sides and throughout the entire length of the Range. On the contrary, the slope is gradual to the grassy top of the divide between the Snake and Swan, so that an easy road might be made from San Juan round the head of the creek to where we stood. We could see the upper forks of the Snake, that they rise well up between those of the Platte and Clear Creek, and that the silver belt on this side is the continuation southwest of the Argentine, Georgetown, and Black Hawk belt, and that here it is not more than five miles long.

Coming down to the toe of Glacier we passed by many gopher holes and over some heavy though scattered blossom. At last we came into the timber and found a handsome shaft thirty feet deep, a considerable pile of quartz out, and on a barked tree close by, "Guibor's Extension of the Coaley, discovered June 21, 1865."

It is but little further to the broken end of the mountain, which is a mass of mineral-stained rock, seamed with galena veins from three to twenty inches in width. From this standpoint we could see a tremendous ledge running high up through Collier Mountain, on the east; and another called Broadway, discovered by Mr. John S. Jones and taken up for a mile, on Bear Mountain, off to the west. All the surrounding mountains are stained with mineral,

their sides and the valleys between them dark with heavy forest.

Coming down Glacier west, we passed by the mines and workings of Guibor & Co., and of Short & Coaley. The latter are hunting among slide and shingle for the George Reeves, above the Potosi. Also just commencing a 150-foot tunnel, to cut the Argentine and Favor. A shaft twelve feet deep on the Argentine shows two feet of quartz and galena. They are also getting out some ore from the surface of the Coaley, to be packed to Georgetown and tested. The Coaley has several open workings, mostly all caved in now. There seems to be a loose deposit of nearly pure galena, twelve inches wide. We saw nothing on the lode that deserved the name of mining.

Guibor & Co. are excavating a tunnel 500 feet to strike the Potosi, now fifty feet advanced, and another much shorter one, aimed for the Geo. T. Clark. Also working on the surface of the Potosi in different places. They claim to have fifteen inches of galena in the Coaley Extension, eight in the Rothschild, and twenty four in the William Bell, all on Glacier.

It may be said with truth that none of these lodes is sufficiently improved to show, hardly to indicate, its permanent character. A good deal is doing and commencing, however, and the people operating are enthusiastic. Another year will certainly develop "one thing or the other." What a pity we haven't a psychometrician or two to tell us what is in the ground so that we need not dig on uncertainties.

About Montezuma there grows a little blue flower, three or four of which emit all the fragrance of a peach tree in full bloom. We must domesticate them if possible. Planted in a bed of stone, kept dry in summer and buried in snow in winter, it seems to me they ought to thrive.

Well, I took dinner with Messrs. Slawson and Collom, Slawson acting the part of host and cook, and parting with them tearfully, found myself about sundown at Peru, the guest of Com. Decatur. But of Peru in my next.

VIII.

PERU AND INHABITANTS.

PERU, SEPTEMBER 18, 1867

Peru consists of a half-dozen inhabited cabins, the occupants of which come pretty near holding all things in common. If one cabin gets a turnip, a potato or cabbage, he sends his compliments to the rest, with an offer to divide. There is as much coming up, and down, and over, and dropping in, among them, as ever there was in any eastern settlement of cousins. The arrival and departure of Utter & Franklin's pack train answer to the arrival and departure of the mails in the other world. These pack trains are quite a feature of this upper country. They take ore out for three or four cents a pound, and bring back grub on their own hook, on which they calculate to make at least four cents a pound. Good butter is worth but sixty-five cents here, however, which is not \$2.50, as it used to be. Mules and jacks are used for packing — the latter preferred, because their keep doesn't cost more than half as much as that of mules, and they are lower in stature, and therefore more easily loaded and unloaded. You can't teach either to kneel like elephants or camels. Eight or ten animals make a train. Their pack saddles are harnessed to them, and their load then hung on in sacks. For ore, rawhide sacks are used; for provisions, gunny sacks. One man can manage a train, but two pay, in that they make better time. It amused me to see all Peru assisting in loading and starting these trains. It amused me more to hear Com. Decatur, an iron, weather-beaten frontiersman of fifty winters, playing that he was young, admonishing the boys, who here are nearly all ex-soldiers, for swearing: saying that if they had no sweethearts, had not been soldiers, and were not now very near his heart, he wouldn't care a d—n about it. To a stranger's use, all these men have is free; but they usually tarnish the grace of their hospitality just a little by telling him that if he don't like their style and fare he may go to h—l. I believe it is that liar Dixon who holds that slavery and urbanity go together. He couldn't always be wrong, you know.

Nothing but prospecting has been done or is doing. The Colorado Prospecting & Mining Company, of which William N. Byers is agent, and Mr. Shields mine captain, perhaps takes the lead. The Pacific Gold & Silver Company, Mr. Tiffany, of Central, agent, and Mr. Burchard mine captain, are doing considerable. Com. Decatur and John Reno form a third firm. Then there are a lot of determined fellows going it alone. The population counted about sixty a month since; now there are no more than half that number, and they are generally preparing to go out soon. The location of Peru is at timber line on the Snake, so near the Range that a man may climb thence to where the East Argentine trail conquers it in forty minutes. The lodes of the district are mostly in Ruby Mountain, a spur running off southwest from Irwin's Peak, between the Snake and Irwin's Creek.

SILVER BELT OF COLORADO.

I should think that a line drawn from Black Hawk to the head of Blue River, would pass through Georgetown, Irwin's Peak, Ruby, Collier and Glacier Mountains. Its course would be northeast and southwest. How much further this argentiferous belt extends, is for the future to unfold. I have no doubt that it crops out beyond the Arkansas, and gave name to La Plata Mountains, southwest of the sources of Del Norte. It is among the traditions of old mountain trappers and traders, that fifty years ago Santa Fe merchants traded for gold dust and silver bars in large quantity along the old Spanish trail toward Buena Ventura (Salt Lake), and *via* the Rio Virgin to Los Angeles. The mines were worked by Mexicans and Indians, who came out to meet the traders, and would not permit the latter to penetrate to their secret treasure-house. There are wilder traditions than that, too: for instance, that there was a Spanish mining settlement among the sources of the Yellowstone in the sixteenth century.

RUBY MOUNTAIN AND HIS LODES.

Near Irwin's Peak a great "horse-shoe" is broken out of the southeast face of Ruby, the "slide" forming a bench which serves as a stepping-stone in climbing either

Ruby or the Range. Winding up over this bench, a wagon-road may be made across the Range to West Argentine. Here are two or three lakelets, fed by ever-during snow-drifts, from which flow off tiny streams to form the Snake. Starting eastward, the creek describes a crescent round Ruby, and passing Peru, not yet a mile old, bears off slightly west of north for the Blue. The lodes run with the mountain, and seem to occur once in twenty yards from base to summit. The banks of the creek above Peru show ledges of stained or blackened rocks, indicating mineral veins, every two or three rods. Gopher holes, which mar rather than mend the promise of these ledges, abound.

Early this morning, piloted by Com. Decatur and Aleck Grayden, the village blacksmith, I started to "do" old Ruby. Half a mile above town we came on the Savage, and a few steps further is the National Treasury. A twelve-foot shaft on the Savage shows a thirty-inch vein, quartz and heavy spar, slightly mixed with galena. The National Treasury has been opened in both banks of the creek. It has smooth, solid, plumb walls, about five feet apart, and a strong vein of galena, say twelve inches. There is considerable ore out, a lot of which is to be taken to Georgetown to be tested. The lode was discovered July 9, 1865.

Taking advantage of the hill we are soon on the bench, horseback, and pass by the Mont Eagle, discovered July 14, 1866. The vein, two or three feet wide, galena and gangue, about half-and-half, is stripped for thirty feet. The Tenth Legion next attracts our attention. It is opened by a side cut, and is a strong galena vein—fifteen inches of fair pay stuff. Here is one of the lakelets spoken of, still partially covered with thick, clean, blue ice, its dark waters reflecting the surrounding crags, and the scarcely higher heaven with its clouds. A small brook escapes from it, and stealing off a little way, plunges over the edge of the bench, and is almost lost in spray before it touches bottom. This is called Silver Fall. In the gorge made thus, of several outcropping lodes, one bids fair to be valuable. It shows a vein three feet in width, one-third galena-bearing gangue. It is claimed and named by two parties, wherefore it shall be nameless here.

Proceeding toward the peak of Ruby by way of the sharp ridge which forms one arm of the horseshoe, we arrive at the Anglo-Norman, five hundred feet above the lake. It was discovered by Decatur & Reno, September 26, 1865, on the very pole of the ridge. A shaft was sunk sixteen feet, which is now fallen in. The vein is soft, three feet wide, one-third pay-dirt, which Decatur says fairly assays \$169 a ton. Under a huge blossom, preserved in red dirt along one wall, seven pounds of ruby ore were found, which assayed at the rate of \$30,000 a ton, or thereabouts. Six or eight rods down the south side of the ridge, an adit has been run in fifty feet. The vein is two feet wide in the adit, soft, half gouge, half pay; the walls smooth and pretty as those of a house. The gangue, when there is any, is quartz and baryta, carrying some galena and perhaps sulphuret of silver. A deep snow-drift descends to the lake on the north side of the ridge. There was none there last year this time, and the vein was struck far below, under what is now snow. I am quite favorably impressed with the promise of the lode, and think it deservedly famous.

Some distance above the Norman, the Leviathan crosses the ridge. It was discovered by Reno & Decatur, September 27, 1865. It is traceable by the black, heavy outcrop a thousand feet, down the inside of the horseshoe, and southward on the mountain side. Nothing has been done on it. Looking from the face of Ruby Peak toward Georgetown is the Silver Star, showing three feet of vein-matter, one-third of it quartz.

The view from the peak, especially of the Snake, Blue and Ten-Mile, dark with pines or golden with ripe sunshine, is fine. Lincoln, Pike, and South Park appear to advantage. Nor is Irwin like to be slighted, since he rises a thousand feet above the extremest ambition of Ruby, and being as near as your hand, his proportions at last begin to dawn on your feeble comprehension.

From Ruby Peak the means of access to this district are well under the eye. A low place in the Range, southeast of Peru, offers a passage for a wagon-road to Hepburn's on the Platte, twelve miles distant. Toward West Argentine, a road may easily be constructed to within five hundred feet (altitude) of the summit. Then it would have to be cut in the solid rock, and on the other side the

same, only more of it. Toward East Argentine, the final ridge is not impracticable, except it might be for the shingle that would eternally roll down and obstruct the road, despite the "Quit! quit!" of the Range rabbits, who don't like to have rocks rattling about their ears any better than other folks. The roads will all be made in time.

Having eaten a dirty doughnut and drunk the emanations of the sublime scenery—a more delicious lunch than Epicure himself ever dreamed of—we started diagonally down the hill toward Peru. Comparatively near the creek we came on the discovery shaft of the Malabar, struck June 22, 1866. It is opened by a huge side-cut, and shows twelve feet of vein-matter, I should think about one-third galena. Two cwt. of the best, reduced by Mr. Beverly, of Nevada, gave silver at the rate of \$100 a ton, I am told. The Pacific Company own the south half, and have started a tunnel for it near the base of the hill. Harrison & Co. own the north half. Aleck Grayden, with much moil and toil, has found the extension north, and Decatur & Reno think they have it south. Mr. Byers hasn't a doubt but that the National Treasury is the same lode further east. A vein of its apparent strength ought surely to be a mile long. The Pacific Company are also opening some veins in the "*aqua divortia* of the continent," as Gilpin calls it, precisely in range with the lodes of Ruby, on the opposite side of the horseshoe from the Norman, Leviathan, &c. It is to be hoped they will strike a good thing and tunnel through; when we should have heard the last of wagon-roads.

Nor is the idea altogether nonsensical. Messrs. G. B. Reed & Co. have three lodes, which appear to cut the Range nearly at a right angle from the waters of the Platte to those of the Snake. One of them, called Massachusetts, at the inner end of a fifty-foot adit, shows an eight-foot vein, eighteen inches galenous ore, one foot pyritous quartz, the rest talcose matter.* Driven through, the adit would strike the head of Worden Gulch, emptying into the Snake from the southeast, a mile or two below Peru. The Snake, with its fan-like branches, interlaps both the Platte and Clear Creek by several miles, and the Range makes a great half-moon round it. The extreme

* Mr Reed took 2,370 lbs. of ore from the best stratum in the Massachusetts to the Georgetown Smelting Company, who returned him \$132.75 as the product. Capital.

sources of the waters of the Atlantic and Pacific are often within a few thousand feet of each other. Let the miners excavate their adits in the Range large enough for wagons, to pass, get charters and take toll. It is a fact that the main Range is being attacked by our hardy prospectors in at least three different localities.

I have told you all I have been able to see of the mines of the district. Decatur gives me the Esmeralda as a specimen of the lodes of Worden Gulch. An open working shows a vein twelve feet in width, pink quartz, carrying considerable argentiferous galena. A sample of the ore assayed \$7,500 at the United States Mint, Philadelphia. A lode on Cooper Mountain, below Peru, has a seven-foot crevice, six inches of good quartz, the rest white, soft, quartzose rock, full of iron pyrites. Most of the ores here carry some copper and iron pyrites, and many of them contain by assay as much gold as silver. Prof. Schirmer has lately been surveying and assaying largely in the district; but I suppose the results of his labors are private property.

In leaving the Snake, I may say that among so many lodes there must be *some* good ones; and if there are it is as much as can be said for any mining district in the world. According to all experience, these lodes are bound to be wrought, anyhow. Without wearying by examples, it is well known that Georgetown could get no hearing in 1850, in 1864, nor even so late as last autumn; yet its lodes, upon trial, have proved to be paying ones. I have no hesitation in predicting the same success for those of Snake River.

To-day is the 19th, and I am in East Argentine; had to go back down the big hill to get some flower plants I had attempted to bring home, had laid down for something and forgotten; so that I am too late to do Mt. McClellan to-day. As I cast a lingering farewell look from the Range over the wilderness of mountains on the west side, I felt the sublimity of the prophetic simile, "And it shall come to pass in the last days, that the mountain of the Lord's house shall be established in the tops of the mountains, and be exalted above the hills; and all nations shall flow unto it," and wished I were a prophet. Indeed, for the moment I believe I would have been a prophet rather

than a capitalist; but I am over it. Give me money or give me death!

IX.

EAST ARGENTINE AND INHABITANTS.

GEORGETOWN, SEPTEMBER 20, 1867

At last I have completed my rounds and am again at "the place of beginning." To-day I have done McClellan and Leavenworth (Burrell) mountains. The ice on the spring at East Argentine was an inch thick at sunrise, the stars having sparkled all night through an almost wintry atmosphere. I early hastened to my flower plants which I had left under the lee of a cabin where I supposed there was warmth of sun enough in the rocks and dirt piled up to protect them from all possible frosts at this season. But the day before had been stormy, and the mountains heading Chicago Creek were gray with hoar frost and sleet up to noon. The flowers, deceitful things, looked all right, that is, the one or two healthy ones the squirrels hadn't eaten off. But the sun appeared to them, and they drooped and died till none was left. The morning was clear and bright as we suppose they were in Eden. Not a sound broke the wide stillness except the blasts in the lode workings which occurred at long intervals, were far from sonorous, in fact lost themselves in surprise.

The town, consisting of a dozen cabins or so under the lee of Pendleton Mountain, has not greatly changed from a year ago. It boasts of a boarding house, the proprietors of which went away a short time since without considering their liabilities. Chickens would do well to roost high when they are around. Here I found several of my favorite prospectors, some I had seen on both my previous annual visits, men who carry their beds and houses with them, who are occasionally reduced to counting their grains of coffee and corn, who, though always broke contrive to get grub enough one way or other to continue following their favorite occupation, who have been at Argentine since it was nothing but a prairie dog town or potatoe patch, and who at first had to carry their picks over the most 'dishonorable trail,' as one of them called it, many

miles to get them sharpened when dull. They were jovial as ever. Two of them in particular, who had just struck what is regarded by the whole district as a good thing—a lode of talcose matter and quartz six or seven feet wide, with argentiferous galena “suently mixed through it,” which is so soft that they had thrown it out to a depth of twenty feet with a spade. They haven’t yet had it assayed because they can’t afford it. They design to sink it a hundred feet this winter, packing up the necessary timbers on their backs, and meanwhile nothing less than \$50,000 will touch it. If it is good they want to know it and have it; if not, they are able to stand it. Their names are James B. Ousley and Leonard H. Merrill, the first from Missouri, the second from Canada, two originals. Ousley is a born humorist, and could he turn his wit to account might abandon prospecting with advantage. Merrill needn’t have told me that he had worked through New England for four cents a day and boarded himself since his talk discovered as much for him.

If I could put what he said to me in an hour about the district, its lodes, “honorable and dishonorable,” gopher holes, dog holes, rifle pits, and his own experience, in ink, Josh Billings and the Confederate X Roads would lay down their pens in despair. The grammar, punctuation and idiom of the English language were quietly ignored. If words used in books didn’t come of their own accord, words of his own invention did. I make so much of these as specimens of a class. They amused me, and so did a Scot across the gulch from town. He was vainly trying to capture a mule and jack who together knew more evil than the original Serpent. Some one suggested that he drive them over to the city (Argentine), when he gruffly replied, “It would be cheaper to bring the d——d city over here.” Well, there are a good many miners working for contractors opening mines for companies. Among the contractors I found my friend E. J. Vance, whilom telegraph man at Central, and Mr. Forristall, a new-comer from everywhere else but here, and especially from California. Mr. Vance has taken the boarding house per force since the old keepers absconded, and makes an accommodating host. Mr. James C. Huff, one of the discoverers of the district, is still here, and working like a beaver. The town has been blessed with the presence of a lady inhabi-

tant, but she has gone away. The Planter's (House where-
at Steele, Patterson, Lane, McNassar, Pine, Dibben, and
others used to hang out, is no more. The romance of the
first settlers' tents and bough houses and spicy out-door
log fires, is sought for in vain in the low smoky log cabins,
the sloping grounds bare of grass, and the hill-side robbed
of its trees.

THE LODES AND WORKINGS.

Mr. Huff piloted me over the eastern slope of Mt. McClellan. There are no workings on the crest except of the Belmont. But lower down, and especially in the great sag where snow lies till August, the ground has been torn up in the hunt for lodes. The water of the melting snow-drift was used for the purpose, and led down the steep hill in different channels, it wore out three or four great trenches from 200 to 500 yards long, to the bed-rock. The surface deposit is from eight to twenty feet deep. Thus were discovered the Wilson, Last Chance, Durango, and Judkins. They are opened by shafts, adits, or cross-cuts to a depth of fifteen or twenty feet, and generally show ten or twelve inches of quartzite, with argentiferous galena disseminated through it, accompanied by as much more gangue that will eventually "make mineral," as the miners say. A lode called the Myer, a little north of these, presents the same characteristics, and evidently belongs to the same group.

The Belmont has a shaft on the crest twenty feet deep, vein of quartz and argentiferous galena, nine inches on one wall, four on the other. Five hundred feet northeast, an adit, forty feet long, most of it in the surface deposit, has been excavated. The last ten feet are on the lode and expose it perhaps twenty feet from the surface where it averages fourteen inches in width, quartz, with argentiferous galena, commonly called here "sulphurets," disseminated through it, colored slightly by fluor-spar. This vein of pay is accompanied by as much more gangue which is expected to make mineral at a greater depth. A few tons of ore have been packed down to Georgetown.*

*Two tons and fourteen cwt. of this ore, treated by Garrold & Martine, produced \$619 30 in silver. A contract has been let to drive the adit, 6 x 6½ feet in size, 100 feet, during the winter. It is at least 13,000 feet above sea, and but a slight distance from the sharp comb of the mountain.

A thousand feet, surface measurement, below this working, Mr. Huff has struck the extension of the lode, and named it Belmont No. 2. He followed the "float" a long distance up the hill, making very heavy excavations. At last it turned downward, and at a point where the "slide" is twenty feet deep. The banks couldn't be kept from caving in, the frost rendered it difficult to blast, the nearest timber was a mile down the hill; in fine, the discoverer wasn't able to develop his discovery. He found the walls of the lode with a gouge on each, four or five feet apart, took out enough of the vein matter to prove its identity in character with the Belmont, and left it. A sample assayed 1200 ounces of silver to the ton. Mr. Huff thinks that Mr. E. B. Hatch, operating for the Boston Mining Association, has struck a third extension of the lode, northeast, which would not be strange, as the Belmont is to all appearance the king lode of the mountain.

Southeast of the Belmont a hundred yards a lode occurs called Bullion, belonging to the Argentine S. M. & E. Co., Mr. C. S. Stowell, agent, very similar to the Belmont. An adit has been excavated sixty feet in length, showing good walls and a quartz crevice three feet in width. A fair assay of six inches of this vein Mr. Stowell puts at 375 ounces of silver per ton. Twenty yards below is another lode called Harris, of precisely similar character. An adit, run in a few yards, shows four feet of loose vein matter. There are ten tons of quartz out.

Still further to the southeast, the Somerville S. M. Co., Mr. W. H. Crocker, agent, are opening two lodes, Wind, and Commercial-Street. Each has been struck by a 50-foot tunnel 30 feet from the surface. Shafts are sinking at the inner ends of the tunnels. The Wind shows no well-defined walls as yet, but for twenty feet in width the country rock is decomposed and veined with indications of lead. The Commercial-Street has six inches of quartz, bearing argentiferous galena, and about eighteen of the gangue, quartz and feldspar, common to most of the lodes in this section.

Down the hill a piece further occurs the Paymaster, also belonging to and worked by Mr. Stowell's Company. An adit has been excavated 125 feet in length on the upper edge of a vein of pure galena, coarsely cubed, averaging after taking out eighteen fathoms on the floor, eight inches

in width. Ten to fifteen tons of galena have been taken out, five of which were sold to the G. S. Co. for \$65 a ton. The Company have a lode just above the Paymaster called Invincible, and another on top of the mountain, Silver Cloud, which promise well.

On the course of the Wind and Commercial-Street, 400 yards to the northeast, is the Great Bear, opened by adit forty feet long, showing four feet of quartz, with argenteriferous galena more or less plentifully diffused through it. The lode is owned and worked by Dr. Birdsall, Gov. Steele, Prof. Dibben, and others. The Doctor has several times got \$500 a ton by assay. Considerable ore has been packed to Georgetown for reduction.

The above comprises all I was able to see of the East Argentine lodes. I was told of the St. Louis, in the Horseshoe, opened this season by H. B. Bearce, said to be a strong lode and to assay well. Also of the Billy Boy, owned and being opened by W. Sherwood, above the trail, beyond the Horseshoe. The shaft is now forty feet deep, good walls, twelve feet apart, five veins of minerals of lead, two feet width in the aggregate.

On the whole, the lodes of East Argentine give much fairer promise than ever before. The district badly needs a road. Gen. Lane and other persons have held a charter for two years, and nearly enough money has been subscribed to construct one. (People here say, that if no one had had a charter, a road would have been made long ago, but that the holders of the charter wish to own the road and have the public build it. Of all the country I have traveled this ten days, and I have crossed the Range twice and been all over a half dozen bald mountains, the trail from Argentine toward Georgetown is the roughest and worst to get along with.

X.

CHRISTENING.

GEORGETOWN, SEPTEMBER 20, 1867.

I should like to be permitted to christen the different streams and mountains of the silver district this side of the Range. One doesn't like to have to speak of "the

right or left fork of the right or left fork of the south fork of South Clear Creek," to designate one of the higher creeks, nor to indicate a mountain is it pleasant to know that it goes indiscriminately by three or four names, or is only known as the mountain on one or other hand of the above-mentioned creeks. Let me suggest, then, that the creek from Georgetown downward to South Clear Creek be known as *Georgetown* Creek; the right fork hence to the Range direct, as *Watson* Creek; its principal left fork, from the Baker mill to Gray's Peak, as *Quail* Creek; the left fork hence directly south as *Leavenworth* Creek; its main right fork as *Argentine* Creek; and the right fork of the latter as *Huff* Gulch. Let the lower end of the mountain wedging apart *Leavenworth* and *Watson* creeks and closing up the valley be known as *Leavenworth*; from *Huff* Gulch to Irwin's Peak, as *McClellan*; northeast of *Huff* Gulch and in Argentine District, as *Pendleton*. Let the mountain on the east of Georgetown be called *Griffith* from where lodes first occur on it as far down as *Beaver* Creek; the elbow of that on the west as *Republican*; on the right of *Watson* Creek as *Sherman*; next above as *Brown*; on the west of *Georgetown* Creek between *Silver* and *Willow* creeks as *Democrat*; thence to the *Notch* as *Columbia*, below the *Notch*, as *Douglas*. The citizens of Georgetown owe it to the general public to permanently adopt names for these objects. It might be done without much trouble by a town meeting. Then writers for the press needn't die of despair in the vain attempt to put a definite idea of the section on paper.

LODES OF LEAVENWORTH MOUNTAIN.

I came down the "dishonorable trail" from Argentine this afternoon to the imminent risk of my mule's and my own bones. In the lower part of Argentine District a little way above the trail, occur the *Thomas*, and *Humboldt* lodes, having shafts from ten to twenty feet deep, showing crevices about five feet in width, stratum of mineral, very rich, three to six inches thick.

Entering *Griffith* District, and gradually gaining an elevation above the creek of 200 yards, we strike a group of lodes running with the mountain, northeast and southwest, and extending two to three miles, in fact to *George*

town, counting in the old gold lodes on which companies were organized by Wm. Riley in 1864. The mountain is very steep and quite rough, the surface deposit is deep, and probably but few of the lodes really outcropping have been discovered. They are extremely rich in silver as far as found and developed, and are in a comparatively favorable location, looking to the southeast, covered with timber, and unfailing water in abundance tumbling along over the mossy-backed rocks below.

The first one I came to is called San Jacinto, and was discovered in August, 1865, by T. H. Russell. The discovery shaft is thirty-five feet deep, between smooth, solid, nearly plumb walls, three feet of quartzite carrying argentiferous galena, two or three inches very rich, assayed by Prof. Hill 1200 ounces of silver per ton. It is traceable a mile, and the extension northeast, called St. Iago, discovered at the same time and by the same man as the San Jacinto, in a twenty-five foot shaft, presents the same general characteristics as to strike, dip, strength, &c.

Next we come on the Equator, Palestine, and Square & Compass, suspiciously close together. The Equator was discovered in 1865 by McFarland & Coulter, who sold it not long since to Messrs. Carpenter, Simmons & Co. Discovery shaft has been allowed to fill up. Thirty to forty yards northeast, a shaft five by ten feet in the clear, has been sunk sixty feet. If it develops the pockety nature of the lode, it also proves that the pockets, in which by the way all minerals occur, are not mere superficial deposits. On the surface there was from two to ten inches of first quality ore, about twelve of second quality, and the gangue, talcose matter mixed with quartz, argentiferous galena slightly disseminated through it, was eleven feet wide. The mineral vein closed at a little distance from the surface, opened, closed, and opened again, so that in the bottom of the shaft it is larger than ever above. The lode pitches into the hill slightly, and has a splendid hanging wall. A drift 15 feet from the surface and 30 feet long exposes 16 to 18 inches of pay in the floor. Another 50 feet from the surface and 16 feet long, shows equally well. In the shaft and drifts the mineral vein has never been missing more than four feet at a time. Ninety yards further northeast, \$600 has been expended hunting in the 30-foot slide for the lode. It has been found and in the

excavation more than enough of first-class ore to pay the expense. The entire cost of the work, including purchase of mining tools and the packing to Georgetown of 28 tons of ore, (\$12.50 to \$15 per ton), is \$2400. They have received \$1800, currency, on sale of silver extracted from 26 cwt. of ore, and have on hand six tons and eight cwt. of first-class ore, worth \$1000 a ton, coin value; 20 tons of \$170-ore as near as can be determined by assay; 20 tons of \$70 ore; and 30 tons worth from \$25 to \$40. The first-class ore is argentiferous galena, with sulphuret of lead and silver chemically combined. Eighteen hundred and seventy-two lbs. of it, not dressed, only selected by hand and hammer, produced 831 ounces of silver, the smelters reserving seven per cent of the yield, not included in the above. The Equator has the largest vein of such exceeding rich ore of any lode ever yet found in Colorado. It is said that its extensions have been struck both east and west.

The Square & Compass belongs to Frank Marshall and others. It is about ten yards above the Equator. A shaft has been sunk twenty-six feet, drift southwest same distance, roof stoped out to the surface. There is a vein of argentiferous galena averaging two inches in width, accompanied by a kind of bastard quartz, the country badly shaken up. Mr. Marshall commenced work on it a few weeks ago, thinking to see if such a narrow vein could be wrought to profit. Two men took out 2900 lbs. of ore in fifteen days, for fifteen cents a pound. This was hauled to Black Hawk, at a cost of \$35 a ton, and sold to Prof. Hill at the rate of \$900 per ton; a profit of more than \$500 on that ton. It is needless to say that the lode is to be worked.

The Palestine has been sunk upon eighty feet, but no ore of consequence was found, and it was finally abandoned on the supposition that it is a spur from the Equator. The O. K. is about 100 feet above the Square & Compass, and is much the same kind of a vein. I am inclined to think that the Equator is the only lode in the vicinity—that the others are veins deriving their life from it. So far as I could see, they are not accompanied with the usual kind and amount of vein matter, but seem like sheets of almost pure metal deposited in the cracks of the country rock, varying in thickness from a half to three or four inches.

Further toward Georgetown occur the Argentine and Clipper. The Argentine Company own the northeast half of the Argentine, Bowman & Co. the southeast half. On the first is a shaft thirty feet deep, eight feet long, space between smooth vertical walls three feet, vein of argentiferous galena varying from six to twelve inches in width, not an extraordinarily rich vein, but paid a profit on the work (sinking a shaft), even with packing down and the great expense of reducing. Bowman & Co. have a shaft adjoining on the southwest, fifteen or twenty feet deep, from eight to fourteen inches of argentiferous galena and three feet of quartzite, which will doubtless make mineral at a greater depth. An assay sample yielded at the rate of 541 ounces of silver to the ton. The walls of the lode are nearly as smooth as though they had been planed, and plumb as those of a house. It is a pretty show for a strong true fissure vein. Bowman & Co. have erected at the base of the mountain on the creek a rough building, water wheel, modified American hearth, &c., with which they have tried to smelt their ore. For want of dressing machinery they have met with little or no success in this branch of business.

Mr. G. B. Reed is sinking on the Clipper, not far from the Argentine. His shaft is started under a towering crag which shows blossom far above the surface, and at a depth of 90 feet he has a 3-foot crevice, quartz and galena; 29 cwt. of the ore, reduced at the Smelting Works, produced \$171.55 in silver.

The Herkimer is the last of this group of lodes that I saw. It seems to run nearly across the course of the others, and on the surface pitches sharply to the south. Discovery shaft has been sunk by contract forty feet. It seems the workmen missed the crevice and had to come up and take it down. Fifty yards below, the vein has been stripped to a depth of six or eight feet for twenty yards in length. The gangue averages twelve inches in width, the rich galena vein full three. Five hundred pounds reduced yielded \$240 in silver. There is considerable of this kind of ore on hand now.

There are a great many lodes on Leavenworth Mountain just struck, not enough done on them to indicate their character. Among them may be named the Indigo, from which a sample of ore weighing sixty pounds and assay-

ing \$1800 a ton, was sent to the Paris Exposition of 1867. The General Marion is near the Argentine, and produces very rich ore. The August and Baltimore American are on the end of the mountain just above town. There has not much been done, nor is there much doing on any except those first mentioned.

XI.

GRIFFITH MOUNTAIN.

GEORGETOWN, SEPTEMBER 21, 1867.

This morning in company with Mr. T. H. Russell and Prof. Dikken I scaled the heights of Griffith Mountain. These may be 1800 feet higher in altitude than the creek. Hence to the top, it is smoother and comparatively level. The trees have been some time dead, yet they still hold their ground, an army of white skeletons defying time. The sun looks in and soft grass crawls over the gray rough pebbles. A fine spring bubbles up, flowing off in a tiny rill, and here a prospectors' camp is planted and gradually growing. A branch of Trail Creek heads just over the ridge, eastward, and affords easy access by wagon to anything near the top of the mountain. On this stream green timber soon commences, and it cannot be far down to sufficient water for a quartz mill.*

Among the lodes are the Alice, Elizabeth, Victor, Magnet, Alice Jones, and Comet. Messrs. Melly & Matthews are opening the first two, getting a small vein of argentiferous galena which assays \$1500 a ton. The Victor was discovered six or seven years ago. It seems to bear it well. There is apparently a large outcrop of quartz, which has not been reduced to confinement between walls as yet. The Magnet, or rather its outcrop, had just been discovered by a long and arduous pursuit of its float blossom. As near as I could determine it is a four-foot crevice, gangue quartz and feldspar, with two veins of rich argentiferous galena, each three or four inches in width.

*It was in this vicinity that Dr. Nash was lost two years ago. The last summer, what are supposed to be his remains were found by a party returning from Chicago Lake. A pair of spectacles, pocket knife, shreds of paper money and clothing, and a few of the smaller bones are all that is left of him. Were they not dumb mouths what a tale might they not tell!

The Alice Jones and Comet had also just been struck and presented about the same characteristics. These lodes I think of excellent promise, and I was glad to hear their owners say that they are going to work on them through the winter.

THE SUMMIT.

A mile north of this spot is the rock summit of the mountain, a dizzy height above the creek. Georgetown and Empire seem under you. Long's Peak is visible in the north. The low wooded hills among which the mines and towns of Gilpin are nestled, sweep away to the northeast. Eastward the Old Squaw and Chief emerge from the purple woods. On the south are the high cold mountains that feed Chicago and Bear creeks. Southwest, Gray's Peak shuts in the horizon, and westward, mountain spurs radiate from Clear Creek and ascend to the ridge-pole of the world. Here is the discovery of the Summit Lode, opened southwest for 600 feet, and supposed to be struck northeast for a mile. It appears to be a strong lode, from four to thirteen feet wide, gangue quartzite, with two or three handsome veins of argentiferous galena, very rich, assaying at the rate of \$2000 a ton. A lot of the ore has been packed down for reduction.

From the Summit we made a detour eastward a mile and a half to see the Glendower. It was discovered by T. H. Russell, July 5, 1867, and shows in a shaft twenty feet deep, a strong vein of quartz stained with oxyd of iron and lead. It is accessible from Trail or Clear Creek. Back again to the Summit, and then down and northward 300 or 400 yards to Saxon Point, the ground very steep and covered with coarse shingle. We passed discovery of the Old Dominion, a three-foot crevice showing about three inches of argentiferous galena. Also the St. Mary, discovered by tunnel twenty yards in length, a two-foot crevice of copper pyrites and carbonate of copper.

SAXON GORGE.

Right here, in what is called Saxon Gorge, a land slide of considerable magnitude occurred last spring, for a few moments endangering half a dozen miners' cabins and

their occupants, situate in one edge of the ravine. The surface of the gulch for ten or fifteen feet in depth and three or four rods in width, seems to have become too heavy to longer cling to the steep mountain side. So one morning about 4 o'clock it started slowly, moving immense pebbles, and sliding half a mile before it found a resting place. One of the cabins is nearly buried. Those who saw it describe it as an awful sight.

Lying against the face of the mountain above these cabins, is a sheet of blossom quartz, seemingly covering an acre or two. Some excavations have been made in it and a vein struck and called George T. Clark. A good deal more work is required to show what it is.

SAXON POINT.

This is about 1,000 feet, altitude, above Georgetown Creek, and two miles below Georgetown. It takes its name from the Anglo Saxon Lode, which has produced to date more ore and more money than any other in the district. Its course is northeast and southwest, its walls nearly vertical, the hanging wall well defined. The main shaft is seventy feet deep, and together with a piece of ground northeast thirty feet deep by fifty long, has furnished seventy to eighty tons of ore, from which \$12,000 in silver, besides what went into the bottom of a new furnace, has been taken by the Georgetown Smelting Company. A test run of 4,100 lbs. of crude ore gave \$1,008 worth of silver. The gangue is quartz and feldspar, argentiferous galena and sulphuret of silver disseminated through it in nodules and veins, clouding and mottling it beautifully. There are other slight workings on the lode, some of them 200 yards distant from discovery. At discovery there are veins and feeders seaming the ledge for twenty feet in width.

Running parallel with the Saxon and about 200 feet southeast, is the Mohawk. It is opened by slight workings for a distance of 600 yards. An adit has been excavated on discovery which shows a somewhat scattered crevice six to eight feet wide, fifteen inches of ore of precisely the same character to all appearance as that of the Saxon. Twenty tons have been taken out, part of which, after being crushed for smelting, assayed 250 ounces of

silver per ton. It was treated in connection with lead ores from other lodes, so that its precise yield cannot be told. Some of it is from fifty to seventy-five per cent. silver, and is cupelled without smelting. Five cwt. picked by hand and hammer, produced 113 ounces of silver. A tunnel is being excavated to cut the lode at a lower level.

On the north side of the Saxon occur the Bethany and American, the first running 3,000 feet northeast from discovery, the last the same distance the other way. They have produced some exceedingly rich ore, but in small quantity, and it is generally believed they are a spur of the Saxon. There are other small spurs or veins in Saxon Point, consequent I suppose on the broken and rough character of the country-rock. All of them produce ores that assay among the thousands, indicating a common origin. It would be very agreeable to me and doubtless to others to know what there is a thousand feet under Saxon Point.

Above these lodes, on the extreme point, is a very large outcrop of quartz, called the Bazaar. Below them are the New Hampshire and Vermont. Further south are the Frank Cram, Keystone, and Notary Public. But little has been done on any of them. The Philo Scoville is reported to be a very strong rich lode, situate further north, toward the junction of Georgetown and South Clear Creeks. A shaft was sunk 35 feet, showing a crevice eight feet in width having regular true walls, and rich mineral pretty evenly diffused through the quartz.

At the base of the mountain below Saxon Point a tunnel has been excavated 50 yards toward the Watertown. Another tunnel called Vauxhall has been located, designed to cut four or five large lodes within a comparatively short distance. Abreast of town is the Griffith, belonging to the What Cheer Company, considered by everybody one of the strongest richest lodes in the District, the first one discovered and from which the district takes its name in fact.

Also the Mt. Diablo, Mt. Etna, Myrtle Hall, Dana, and Cincinnatus, parallel and near together, very favorably located for tunneling. They are all strong lodes, carrying sulphuret and carbonate of lead, sulphuret of silver, and iron pyrites. The Mt. Diablo yields from \$125 to \$230 per ton. These last belong to C. R. Fish and J. O. Stewart.

XII.

A SABBATH JOURNEY.

GEORGETOWN, SEPTEMBER 22, 1887.

To-day being Sunday, I rested. Or at least I only made a Sabbath day's journey. In old times that was one mile. But then, a week day's journey was only twenty miles. Now, a week day's journey having been enlarged from twenty to six hundred miles, is it not justifiable to enlarge the Sabbath journey from one to twenty-five? In short I went to Idaho, took an ocean bath, and returned. As to the rest that I did, behold, is it not written in the book of the recording angel? Or perhaps it may be found in the *New York Loafer*, or the *Bungtown Banner*!

YOUNG AMERICA LODE.

On my way I stopped at Mr. Calvin Kinney's, Downieville, and took a look at the Young America, a lode of which I had heard it said for weeks that it is without doubt the best one in the county. It was discovered last spring by L. H. Merrill. Calvin Kinney owns the west half (1500 feet), Kirtland & Leeper the east half. The locality is the first bar above Downieville, a mile below the forks of South Clear Creek, precisely in the silver belt. The lode runs east and west a thousand yards, on a little plateau top of a ledge of rock 200 feet high, looking to the south. Here need be no detention from snow and cold. In the heart of the Clear Creek Valley, there is plenty of sun, room, water, timber, and ease of access. The bar at the base of the ledge is two or three acres in extent, and a tunnel thence 150 feet long, would cut the lode 100 to 200 feet from the surface. It may be the force of contrast that causes me to dwell on these advantages of location. My toilsome climbing of the last ten days is not calculated to blunt my appreciation of them at least. The reader will oblige me by making all necessary allowances. But it is one of the prettiest locations and most favorable for working I have ever seen.

On No. One, east, a shaft has been sunk twenty-five feet, and a drift on the bottom east and west excavated fifty

feet in length. Throughout this working the appearance of the walls and pay-vein is uniform. The foot wall pitches a little into the hill, hanging wall not yet found I think. The crevice is three feet wide, the pay-vein in and out from ten to twenty inches, average width fifteen inches, with thin feeders running out and in, visible on a close inspection of the walls. The gangue is quartz and heavy spar carrying argentiferous galena, together with sulphuret of silver, iron, and copper, carbonate of copper and lead, &c. Picked specimens assay from \$800 to \$4000. It will work above \$100 a ton. There is considerable ore out and some of it is being treated at the Live Yankee Reduction Works.*

West of discovery the vein seems to produce more pure argentiferous galena than further east. It is stripped for fifty yards, and several tons have been taken out. Unable to get any satisfaction from five tons carried to the Georgetown Smelting Company, Mr. Kinney has commenced the erection of works of his own on a small scale and after the pattern of Garrott & Martine's. He has a water power 900 feet long, giving a head of sixteen feet, a fine mill-site, flume, water wheel, eight stamps for dry crushing, and a furnace for roasting or smelting or both as he may elect. He expects to be reducing his ores successfully by cold weather. He has been encouraged to this by hand tests of its richness. For instance, forty lbs. selected ore, pulverized in a mortar and amalgamated on the same scale, produced eight dollars in silver. Nine lbs. produced \$4.15. Several other tests, in one or two pound lots, have resulted similarly.

The Young America is undoubtedly a true fissure vein of silver. Mr. Kinney expects it to yield \$300 a ton steadily. I believe it will yield \$100. And that is enough. It is more than three times the average yield of the silver mines of Mexico. It is ten times that of the famous Potosi Mountain in Peru. It is more than double that of the Comstock. It is fifty times as rich as gold ores that are worked to great profit in Australia, and at least three times as rich as many of the California ores which are worked to profit. The mine properly opened, which be it remembered is five times as costly per fathom of rock removed as the after work, reduction works erected and in

*One ton and 17½ cwt assayed \$133, produced \$115 71 per ton. 37 per cent, of the assay.

operation, the expense of mining and treatment need not exceed twenty dollars a ton under any circumstances. To say that big money cannot be made with such a property, that is, a fifteen-inch vein worth \$100 a ton, in such a location, water power abundant and not a stone's throw from the delivery of the ore at the surface, is an acknowledgment of ignorance or imbecility on the part of the sayer.

Nor need there be any hesitation as regards treatment. Such ores have been worked in Europe for centuries, and all we have to do is to follow a beaten track. Garrett & Martine have gone before, even in this country. At a great disadvantage on many accounts, scrimped for money, with no varied practical experience, with little merely mechanical ability, in a new district where the character of the ores was unknown, working on small lots from different lodes, they have been successful. They have extracted on an average eighty-five per cent. of the assay. The fifty or sixty tons of ore they have reduced has yielded an average of \$110 a ton in silver, and as a rule the richer argentiferous galena of the lodes round Georgetown has been sent to the smelting instead of the amalgamating works. There are no such difficulties to encounter in the reduction of silver ores as in those of gold. And it has been the trouble in reducing and that only which has kept Colorado down—which has prevented her citizens from making good every representation they have ever made with regard to her mines.

XIII.

DEMOCRAT MOUNTAIN.

GEORGETOWN, September 23, 1867.

To-day a large party was to have made the tour of Democrat Mountain, among them some gentlemen from the East. All the horses and mules and cattle in town were engaged, and so *we* took it afoot—Ben. Darrah, B. H. Smith and myself. The mountain is cut off from Republican by Silver Creek, which empties into Georgetown Creek near the lower end of town. It is a little north of Silver Creek that the Dictator, Congress, Talisman, New

Boston, Sam Holmes and Silver lodes occur, at nearly regular intervals, as one climbs the hill. Their general course is south sixty to seventy degrees west, and it seemed to me that the Muscovite, a good deal higher up the hill than the group mentioned, is on their course—is perhaps the New Boston further west. The Beecher is near the Muscovite. From these the ground ascends more gradually, the surface deposit being five to ten yards deep, and covered with a thrifty growth of trees. On the summit of the mountain occur the Astor, Keokuk, State of Maine, General Scott and Tom Corwin, and going down the crest northward, the Nyanza, Crescent and Patterson.

The Dictator is marked by a heavy outcrop, in places extending two hundred yards. A side-cut exposes a crevice five or six feet wide, with two large veins of quartz. The foot-wall pitches a little with the hill, hanging-wall not yet defined. Discovered by Churchill & Perry, October 10, 1865.

Running parallel with the Dictator, and one hundred feet north or northwest, is the Congress, discovered by H. C. Parker, August 10, 1865. It has been exploited by shaft to the depth of ninety feet, and forty to fifty tons of ore raised. It is a quartzite, with sulphuret of iron, copper and lead disseminated through it, and assays ninety dollars silver and twenty gold per ton. There seems to be every indication here of a true vein of full average power.

The Talisman was discovered September 1, 1865, by T. H. Russell. A shaft thirty feet deep shows six inches of galena, sixty per cent. lead, and carrying \$50 a ton in silver. There is besides a foot of galena-bearing quartz, which will make more or less mineral further down.

Perhaps the reader thinks that the lead in such ores is not of much account. As soon as railroads reach us, it will more than pay the expense of mining and reducing, leaving the silver clear profit. It isn't like working a ton of gold ore, where the product is counted in ounces. A ton of this galena yields a thousand tons of lead, worth in St. Louis \$100. Say it will cost that amount to mine and reduce the ore, and carry the product to St. Louis. Isn't the bullion clear gain? But it won't cost more than \$50 to mine and reduce a ton of the ore and carry the product to St. Louis. Freights eastward from this country have

never been more than 25 per cent. of what they were westward. They will not be by rail-car more than by wagons. Freight from Colorado to the Mississippi River will be merely nominal. And when it comes to pass that, with an average six-inch vein of pure galena it shall cost more than \$25 a ton to produce and smelt the ore, the business had better be abandoned. So that, in case of galena ores bearing \$50 a ton in silver and 1,000 pounds of lead, we must have a profit of \$100 a ton when lead and bullion shall both be available and come into the account.

The New Boston is the king of all the galena veins yet found in this district. It was discovered by Darrah & Parker, August 18, 1865. From a shaft less than thirty feet deep, 100 tons of galena, coarsely granular and carrying from \$30 to \$50 per ton in silver, have been taken. I went down the shaft. The foot-wall pitches slightly with the hill, and carries a six-inch vein of finely granulated galena; then there are three feet of gangue, galena disseminated through it; and finally two feet of solid, pure galena, and still no well-defined hanging-wall. Thus the crevice, so far as ascertained, is six feet in width, half of it galena quite free from gangue. The ore is taken out in chunks of a thousand pounds weight. The New Boston Silver Mining Company, W. B. Rockwell, agent, own the eight hundred feet west, including shaft described. Messrs. Parker & Darrah own the east eight hundred feet.

The Sam Holmes, near the New Boston, is the same style of lode, and belongs to the same company. A side-cut twenty feet deep shows a smooth foot-wall, pitching slightly, like all this group of lodes, with the hill. There is a large pile of quartz at the shaft, bearing galena in coarse cubes, also pyrites of iron, oxyd and carbonate of lead, &c.

The Silver Lode, also near the New Boston, was discovered in "the early day," and belongs to the Wilson & Cass Company. A shaft has been sunk thirty feet on the heaviest of several veins of quartz seaming a ledge of gangue twelve feet in width. The vein is twelve inches wide, quartz, bearing argentiferous galena.

The Muscovite is probably a thousand feet, altitude, above the creek. The finding of a piece of galena weighing sixty pounds in the surface detritus, led to its discov-

ery by Parker & Darrah, August 25, 1865. About fifteen tons of galena were taken from the surface, and sold to the smelters for \$1,000. The crevice is four feet wide, the galena vein twelve inches. The Muscovite Mining Company, B. H. Smith, agent, own the east half, Rockwell & Shipman, the west. Mr. Smith is sinking a shaft ten yards east of discovery, in which the lode and the country rock are badly shaken up. Fifty yards west, a shaft has been sunk thirty feet. In the bottom it has both walls, crevice average width, quartz resembling country rock, honey-combed, and stained red and black by minerals of lead. It contains also sulphuret of iron, and sulphuret and carbonate of copper; assays from \$30 to \$250, gold and silver. The Muscovite is regarded as a strong, true fissure-vein.

Not far off, and running parallel with the Muscovite, is the Beecher, discovered by Parker & Darrah in August, 1865, and owned by the Bohema Company of Denver, who have done nothing with it this year. A wagon-road, built by the Company, crosses it about a hundred feet below discovery shaft, which has fallen in. From the road an adit has been excavated seventy feet west, and the lode stripped on the surface three or four feet deep to the shaft. The crevice is rotten quartz, four to six feet wide, containing galena in pockets, and quartz with an unusual amount of earthy matter in it, black as if from a volcano. The lode has produced considerable galena, and a furnace was built last year by the Company. It probably failed of success for the want of ore-dressing machinery. It is one of the strong lodes of the district, is taken up for ten thousand six hundred feet, as the Beecher, Beecher Extension, General Scott, Tom Corwin and State of Maine—all these west from the Beecher, the last running down the western slope of the mountain toward Bard Creek.

The Astor is on the summit of Democrat Mountain, a cold, bleak spot, where the timber has learned to crawl instead of climb under the incessant energy of the west winds; discovered August 13, 1866, by Cooper & Fisher, belongs to the Silver Creek Mining Company. A hole twelve feet square and twenty feet deep, exposes a vein or sheet of very rich argentiferous galena on the south wall, four feet of loose country-rock seamed with veins of quartz, and three feet of quartz, bearing more or less

galena, quite free from gangue. Six pounds of the best of it produced 24 ounces of silver. Some small lumps are 45 per cent. silver. Five tons, reduced by Garrott, Martine & Co., assayed \$265.59 per ton, and yielded 1,017 ounces of silver, coin value, \$1146.68; yield per ton, \$229.33 $\frac{1}{2}$; per cent. saved, 86.5. Not enough work has been done to show the permanent character of the lode or of the ore. The indications are exceedingly fair for a strong, rich vein. East, five hundred feet, an adit has been commenced which is 12 feet wide, yet hardly contains the whole outcrop. The lode has been struck in nine places east of discovery.

The Tom Corwin is near the Astor, has three shafts 20 feet deep within four hundred yards, showing 6 $\frac{1}{2}$ feet of crevice, two-thirds pay, quartz and galena; assays 181 ounces of silver per ton; belongs to the Silver Creek Mining Company.

Mr. C. H. Moor has found the extension of the Corwin west, called the State of Maine, which shows the same strength as the Corwin, and the same quality of crevice material.

At the head of Willow Creek, which cuts off Columbia from Democrat Mountain, occur the Nyanza and Crescent. They were discovered June 21, 1867, by Rigsby & Sites. The first has been struck one hundred yards in length. An open cut, fifty feet long and ten deep, shows a five-foot crevice, vein of quartz and galena from six to fourteen inches in width, comes out in pieces weighing half a ton. The Crescent is near and much the same as the Nyanza; shaft 30 feet deep, 4-foot crevice of quartz and mineral; assays \$6,500. Four tons of ore from the two lodes yielded \$261.55 in silver.

The Cliff Lode is about a mile from the base of the mountain, near the head and on the left side of Willow Creek. It was discovered by Clark Russell & Co., July 22, 1867. The discovery shaft is 20 feet deep, the crevice six feet wide, 18 inches of quartz bearing galena. Ninety-four cwt. of ore has been packed down at a cost of \$20 per ton. Eighty feet below discovery, a shaft has been sunk 50 feet, but it has lost the crevice. Assays vary from \$31 to \$7,300.

Two hundred yards northwest of the Cliff is the Junction, supposed intersection of the Nuckolls and Mexican. Being two thousand yards above the creek, it would work

to best advantage from Bard Creek. Discovery shaft is 20 feet deep, crevice eight feet wide, solid quartz leader eight inches thick, coarsely honeycombed, full of argentiferous galena, and containing native silver. The average of six assays, from samples taken across the crevice, made by A. D. Foster, was \$1,293.19, silver per ton. There are other slight shafts and workings on the lode, and an adit is being excavated two hundred yards east, which gains depth very fast. It was discovered July 25, 1867, by E. W. Rogers, and was recorded eight hundred feet west, and twenty-two hundred east, with the view of finding a western extension. It has been found, and a shaft sunk 20 feet, developing 18 inches to two feet of solid galena-bearing quartz.

On the summit, near the Nyanza and Crescent, occur the Keokuk and Patterson lodes. The first was discovered by Robert Espy, September 20, 1867. A shaft has been sunk 22 feet, showing a crevice seven feet wide, between regular, vertical walls, half of the crevice considered pay, quartz and galena. The Patterson has been sunk upon 15 feet, and shows a quartz crevice two feet in width, no walls yet.

Near the base and on the eastern face of the mountain, in a most favorable place to work, occurs a group of lodes—North American, Brother Jonathan, Calhoun, Planters, Happy Valley, &c.

The North American crops out at the base of a great ledge, for five hundred feet in length, quartz stained yellow and red by minerals of lead, bearing considerable rich argentiferous galena, three to four feet wide. Not much work has been done on it, but its outcrop and some tests of the ore on a small scale leave no doubt as to its value. Two assays detected the presence of silver at the rate of \$1,600 and \$2,000 per ton. Ten dollars in silver were taken from 20 lbs. of the ore.

The Brother Jonathan belongs to Messrs. Goss & Co., and is being opened by adit, now twenty yards long, head twenty feet high, sulphuret of iron and argentiferous galena disseminated evenly through the gangue-rock. A picked specimen assayed \$750. The Planters, Happy Valley, and Calhoun are near by, and are of similar character to those described.

In this vicinity, although in the left bank of Silver

Creek, is the Deming Lode, belonging to William P. Linn. He has excavated an adit along the north wall seventy feet, then a cross-cut, all the way in quartz, bearing galena. It is probable that it is not very rich beyond four feet from either wall. It assays about \$50 a ton.

COLUMBIA MOUNTAIN.

Cut off from Democrat by Willow Creek, Columbia Mountain boasts of the Hunkadora, Morrison, Wentworth, Bunker Hill, Monticello, Nuckolls, Mexican and other lodes. The last three crop out in the north bank of Willow Creek, from eight hundred to two thousand feet above the valley, run parallel, and have many characteristics in common. William P. Linn discovered the Mexican, July 20, 1866. The lode pitches slightly with the hill; walls of average regularity and four feet apart, as determined by shaft 75 feet deep. Ten pounds of the surface ore, vein two feet wide, produced silver at the rate of \$1,012 a ton. This deposit ran out twelve feet from the surface, and for ten yards the vein was barren or nearly so; then a pocket was struck, into which an arm was thrust twenty feet, finding an average 12-inch vein. It held downwards seventeen feet, when it again became barren.

This and the Equator, noticed in my letter of the 20th, show the nature of these veins to be the same as that of all others—in and out, open and closed, rich and poor, pockety, uncertain, the more tricky in proportion to their want of power. As compared with the gold lodes of Gilpin County, I think these veins are weaker, but not perhaps less regular. Your barren places, called "cap," often continue 100 to 200 feet, and your pockets of ore are correspondingly extensive; here an ore-pocket or vein seldom holds more than 20 feet, and the barren places are only of corresponding extent. Then the country here is higher above water and more broken up than yours; consequently the veins are more scattered, and their permanent character can be determined only by deeper exploitation. Per contra; the ores are richer, and much more easily reduced.

The Nuckolls is one hundred feet above the Mexican, runs parallel, and is the same kind of a lode. Discovery

shaft is 34 feet deep, drift 25 feet west; shaft 35 feet east, 63 feet deep; ore vein, galena, 10 inches thick. It is drifted out on the surface between the shafts, except in two places where the ore crevice is left standing, two feet thick, on the hanging-wall. It is so left to the bottom of discovery shaft. The lode has true, vertical walls, with "slickensides," generally five feet apart. It is opened by adit, two hundred and fifty feet east of discovery. Seventeen and three-fourths tons of ore, reduced by Garrott, Martine & Co., yielded \$1,733.67, coin.

The Bunker Hill, above the Nuckolls, has a shaft 20 feet deep, showing a 3-foot crevice, three inches of very rich argentiferous galena; assays with the highest.

The Monticello comes next as we ascend. It was discovered July 20, 1867. The shaft is 30 feet deep, 5½ feet between walls, all a coarse quartz, with seams of galenous matter between the strata. From this hard, bluish quartz, which no one would suspect of bearing metal, silver will sweat out on the application of heat. It assays from \$140 to \$700, and the indications are fair for a strong lode. It belongs to Steele, Archibald & Gray.

The Wentworth is northwest of the Monticello half a mile. A shaft has been put down on it 30 feet, showing a very strong pay-crevice.

The Morrison has a shaft 30 feet deep, and an ore vein two feet wide, accompanied by three feet of vein matter that is expected to make mineral deeper.

The Hunkadora is half a mile north of the Willow Creek lodes, and has a more east-and-west course. It was discovered by the Phillips Brothers, June 16, 1867, three thousand feet taken up, and the extension east and west. In the working shaft, 50 feet deep, they have a 5-foot crevice, two-fifths of it pay, assaying \$200 to \$500 per ton. A dozen tons of pay-rock have been taken out, and some of it packed down for reduction. There are two or three other shafts on the lode, from 20 to 30 feet deep, all of them showing smooth, regular walls, pitching slightly south. It promises as fairly as any lode I have seen about here. The extension east is called Parker, and is being opened and looking well.

REPUBLICAN MOUNTAIN.

This is a mountain with two faces, one toward the east and one toward the south. There is a group of lodes on the southern exposure, running with the mountain, cropping out at nearly regular intervals from base to summit: South American, extension west, McClellan, Morning Star, Granada, Alhambra, Vesuvius, Elijah Hise, Silver Eagle, Glenalbin, Cataract, Bradford, Bismarck, White, Essex, and many others.

The Hise was exploited last winter to a depth of 60 feet, the crevice averaging four feet in width, six inches very rich galena, assaying 600 ounces of silver per ton; has all the marks of a true, rich silver lode.

The South American has been struck for two hundred and fifty yards, has one shaft 30 feet deep, three feet of pay-quartz, with argentiferous galena and some black jack disseminated through it, foot-wall perfect and inclining slightly with the hill. Seven hundred feet east of this shaft is another 15 feet deep, showing 12 inches of pay-quartz and ore. The lode crops out in places between the two shafts. The ore assays very largely. Ten or twenty tons have been mined. I have seen no lode in the district that looked better or enjoyed a more favorable location.

The McClellan crops out in a ledge of rocks, and is badly scattered. There is one slight shaft under the ledge on the west side, one on each of two 6-inch mineral seams, twelve feet apart, on the east side of the ledge. The ledge is about forty feet long and high, and has three or four of these veins, about four inches thick, running through it. They evidently constitute one lode.

The McClellan and South American, and some other lodes parallel and above, belong to the Evans Prospecting and Mining Company, who have faced down and pre-empted a tunnel site below them on the creek, designed to cut them all. Abreast of the tunnel site the Company own several hundred feet of water-power.

The Morning Star has a shaft 30 feet deep, crevice four feet wide, about 12 inches of pay, quartz and galena, with a good deal of copper; looks rich. The outcrop of the lode is heavy, east and west.

The Granada and Alhambra are not improved enough to show what they are; only prospect holes on thin veins of ore.

The Vesuvius, below and near the Hise, has two shafts, 20 feet deep, average crevice of quartz and galena; looks well, considerable ore out.

The Glenalbin shows well-defined, permanent walls, $4\frac{1}{2}$ feet apart, galena, assays at the rate of \$349 a ton.

The Silver Eagle is very much such a lode as the Glenalbin; has a very strong vein of galena, which has assayed as high as \$1,200 and \$2,000 per ton.

The Correct is higher up and further west; has a shaft 16 feet deep, eight feet between walls, one mineral vein four inches thick, and four others from one-half to three inches in thickness; average assay, \$536 a ton.

Well on the summit of the mountain, Messrs. Patterson & Hines have discovered six lodes, the best appearing of which are the Cataract, Bradford and Bismarck. The walls of the Cataract are 10 feet apart, 6-inch vein of argentiferous galena, assays \$1,000. The Bradford has a 4-foot crevice, 6-inch vein of argentiferous galena, assays \$200. The vein-matter of the Bismarck is four to five feet wide, quartz, bearing galena, 11 inches.

The Essex is a new discovery of Steele & Co.'s, half a mile southeast of the Astor. Twenty feet from the surface it has six feet of vein-matter, 20 inches pay-rock, galenous quartz.

The White is the king of Republican Mountain, so far as yet known. It has both walls, pitching slightly into the hill, six feet apart, two feet of quartz, bearing galena, sulphuret of silver and native silver. The lode is traceable by the outcrop five hundred yards. A shaft 30 feet deep produced several tons of ore, nine of which, not closely selected, yielded \$683.20 in silver.

All these mountains are covered with trails, and ore is packed down from the highest of them for \$20 a ton. They are admirably calculated for tunneling, upon the advantages of which, in extensive mining, it is not necessary to expatiate.

XIV.

AUTUMN.

WILLIS GULCH, SEPTEMBER 30, 1867

In accordance with my intention of reporting fully on the silver mines of Colorado, I to-day make a partial tour of this section in company with Mr. Augustus Blackman and other gentlemen. I was delighted with the autumnal tints mottling the mountain-sides far and near, as if one were in a vast amphitheater hung with vivid paintings. Nowhere can the eye escape the rich variety of coloring, the dark purple of the evergreens, the crimson and gold of the aspens, the silver gray of the hill and mountain tops—all and more than the tints of the rainbow are now on annual exhibition by an artist who produces such perfect work, on so grand a scale, and with so little effort, as to make her most gifted imitators seem tame and spiritless. There is no charge for inspection, no catalogue of subjects or objects, no doorkeeper, no possibility of monopolizing the original. It is free to all, rich or poor, sick or well, and from its very commonness is generally neglected or beheld with an indifferent eye. Perhaps it is to brighten the blessing that it annually takes its flight. There was a sharp blast from the Range this morning, the *avant courier* of winter, and the poor little leaves, which for several days have made the whole country-side a feast for the eye, rattled helplessly to the ground. If you ever have the chance and have any taste for poetry, read the Rev. Robert Collyer's sermon on "What a leaf said." I started to say that I was delighted with the unusual beauty of the scenery, and surprised at the extent and success of husbandry at an elevation of 9000 feet above tide-water.

FARMING

A great many people said that Mr. Hickcox was a fool for taking up and improving a ranch in the heads and forks of these high gulches. But he made \$6,000 net the first year. He cultivates thirty acres, and has about a thousand acres fenced in for pasture. We haven't been out of sound of the dreamy cow-bell, all day. Among

other rancheros of the vicinity are Messrs. Hall & Banta, Eichar, and Drake. Probably not less than 200 acres are under the plow in Russell Gulch and tributaries. Messrs. Hall & Banta have sold \$15,000 worth of produce off their ranch in a single year. Mr. Hall showed us 1400 bushels of fine ripe sizeable potatoes in one bin. He cultivates sixty acres, and has threshed and measured up seventy bushels of barley from a single acre. He has harvested 100 bushels of potatoes from half an acre, although that is about the average of this dry season for an acre. His barn, full to bursting with oats, barley, and hay, looks like living. I believe the 15-lb. turnips which were sent to the Fair last fall were from the head of Eureka Gulch, considerably higher than it is here. Just over the divide from there, as one goes down to Fall River, may now be seen a small field of oats, which will clean up eighty bushels to the acre. It seems to me that these facts are wonderful—of curious interest beyond their immediate bearing on the supply of our wants. Neither are they unimportant in that regard. It is rather nice to have a fine farm with a gold mine in every odd fence corner.

THE LODES.

This entire district is gridironed with gold and silver-bearing lodes, as is well known. The Saratoga, Chase, Nottaway, Caledonia, Pewabic, Alps, Topeka, Harsh, Williams, Clay County, and other famous gold lodes are in sight. Two years ago there was quite an excitement over the discovery of silver lodes at Argentine, on the Snake and Ten-Mile, here, and below Black Hawk, all in range, northeast and southwest.

The silver belt seems to lie along the southeast side of the gold belt as far as either is known. Messrs. Reese, Krause & Bruckner have opened a silver lode near the Four-Mile House, from which they expect soon to obtain enough ore to run their reduction works. At first they had but about eighteen inches of crevice. Shortly that closed up, but at sixty feet depth the walls are six feet apart. The ore assays about \$100 a ton, chiefly silver. I mention this to show that silver lodes occur this way from Georgetown. Indeed it has long been well known that the Crystal and Seaton lodes of Idaho District bear more

silver than gold, the Crystal, at a depth of 100 feet, producing \$80 a ton, silver, working test

THE FRANKLIN.

The Franklin, king of the group of lodes I examined to-day, is evidently the extension east of the Crystal, there being a space of 1500 or 2000 yards between them. It lies along the southern face of the mountain overlooking Idaho, its course east ten degrees north, its underlie north, fifty degrees. It crops out in place six to ten feet wide for 300 yards. There are three workings by shaft, one, the discovery, ten feet deep, one on No. 3, thirty feet, and one on No. 4, fifty-six feet. All these workings show precisely the same characteristics. The walls are of a uniform strike, dip, regularity, smoothness, and solidity, and four to five feet apart, indicating a strong true fissure vein.

Most of the crevice matter is rich enough to pay, under any circumstances, but there is twelve to eighteen inches of argentiferous galena very free from gangue, in both the deeper shafts, which fairly assays \$100 to \$150 a ton, mostly silver, thirty to sixty per cent. of lead, and some pieces twenty per cent. of copper. Last summer Messrs. Lyon & Co. purchased 150 to 200 tons of this ore, paying \$50 a ton, at the shaft. This is all sufficient proof of its quality, better than a thousand assays. It is probably worth \$100 a ton. There is about twenty tons of what they call second-quality ore at the shaft, which looks better than a great deal of the brag ore of the country. I should think that this would work to perfection by the California process, while the galena would smelt in the simplest furnace. There is a little black jack in it, some sulphuret of iron, green and blue carbonate of copper, carbonate of lead, &c. Altogether, it is one of the few silver veins sufficiently developed to swear by. Well managed, I can think of no more safe or desirable investment. The ore by proof is worth \$50 a ton at the lode, and can be furnished by contract for five dollars, or say ten. Mr. Hickcox used to raise twenty tons a week with eight men, night and day shifts of four each. This was in sinking a simple shaft. Excavating the shafts and galleries which first properly open a mine costs five times as

much per fathom of rock broken as afterward in back stoping. The Franklin was discovered in the winter of 1865 by Joseph F. Hall. It is in Idaho District, Clear Creek County, three miles from Central and perhaps two from Idaho, and can be worked from either side. A hundred yards or so below it is Gilson Gulch, putting into South Clear Creek two miles below Idaho. Into this all the furrows of the slope around concenter. Mr. Hickcox has here taken up a mill and tunnel site. The latter will cut a dozen lodes, running parallel with the Franklin, in the course of 200 yards, from 300 to 400 feet from the surface. Some of them belong to him and Mr. Hall, and they are very similar in general appearance, so far as developed, to the Franklin. For instance they all have the same strike, dip, power, outcrop, and gossan. Among them may be named the Williams, Burlington, Waterloo, Mountain Lion, Covington, Pine Tree, Greenwich, Garden, and Freighter's Friend. The latter is believed to be the extension, west of Gilson Gulch, of the Franklin. It is on the same course, produces the same kind of ore, and has the same dip, strength, and general appearance. A shaft has been sunk 40 feet, and considerable galena taken out, some of which was sold to Lyon & Co for three cents a pound. The ground is smooth, the exposure sunny, the hills covered with trees. A good wagon road leads *via* Lake Gulch and Bobtail Hill to Black Hawk and Central.

XV.

MOUNTAIN HOUSE DISTRICT.

BLACK HAWK, OCTOBER 4, 1867

I have been looking at the silver and copper lodes recently discovered in Mountain House District, adjoining the gold lodes of Gregory District on the north and north-east, the copper belt running across the heads of Ralston, south perhaps a quarter east, the silver cropping out on Mishler Hill and running west perhaps a quarter south, across North Clear Creek, and on to near the head of the right fork of Fall River.

THE SILVER LODES.

These consist, so far as I was able to examine, of La Plata, the Blue, May, and De Profundis, on Mishler Hill, half a mile south of the Four-Mile-House; the Leavenworth, Tows, and Humboldt, a mile west 25 degrees south, really in Missouri Gulch; and the Omaha, two miles further west, just northwest of Quartz Valley.

The course of La Plata is south 75 degrees west; it has been exploited by three or four shafts from 30 to 80 feet deep, and a drift 40 feet in length. Messrs. Teats & Co. are working it, delivering the pay-rock at the works of Reese, Krause & Bruckner, who are erecting suitable machinery for its reduction. They had 14 inches of pay-rock 20 feet from the surface, which continued in a drift eastward 35 feet; 35 feet deeper the pay-streak had widened to 20 inches. Then there was 20 feet in the shaft with no pay, but it is again opening. The walls are well defined, vertical, and from 4 to 6 feet apart, the solid leader of the vein, both in the shafts and drift, from 12 to 20 inches in width. It is a flinty quartz, white, tinged with pink on the surface, with argentiferous galena and minerals of copper disseminated through it. Choice pieces assay \$1,000 per ton; 12 to 20 tons have been mined and taken to mill. It is expected to work \$50 to \$100 per ton.

Crossing the line of these workings at an acute angle, which extend 200 feet on the lode, are workings of about the same nature and extent belonging to Mr. Havens of Black Hawk, who claims the lode as the Circassian under a previous discovery. From the shaft where the two lines cross, Mr. Havens has taken perhaps ten tons of pay-rock. There has been one trial of the contested claims before a jury, which failed to agree, and both parties are continuing their improvements. The indications are fair for a true silver vein of average width.

The May is about 100 yards north of La Plata, and has the same characteristics so far as developed, except that it carries more copper. The working shaft is 30 feet deep, no defined walls as yet but a vein of quartz 12 to 20 inches thick, bearing argentiferous galena, minerals of copper, and chloride of silver.

The Blue is near those described, shaft 40 feet in depth, well curbed, 8 x 12 feet in the clear. This space seems to have been filled with loose vein matter. The thirty tons of ore at the shaft is to all appearance as rich in copper as in silver.

The De Profundis is south of La Plata, has been sunk upon 60 feet, shows the same general characteristics as the others mentioned above. The two latter are now being worked.

A thousand yards west is the discovery of the Leavenworth, a galena lode, traceable half a mile by the blossom, struck in place for 500 yards, evidently a "mother-vein," as Mr. Reese would term it. On No. 2 west a shaft is being sunk, now 50 feet deep, well curbed, 4 x 9 feet in the clear. Here the outcrop for 50 yards in length was galena. It gave out on sinking, was succeeded by a coarse bastard quartz, now in its turn giving place to galena, mixed with considerable gangue and earthy substances.* The crevice is about 6 feet wide, quartz vein 12 to 20 inches, assays from \$50 to \$150 a ton. Fifty rods east from this shaft rock is found from which silver oozes in globules on exposing it to a wood fire. The locality is easily accessible from the Denver stage road or from North Clear Creek *via* Missouri Gulch. The Leavenworth belongs to the Belden & Tennel Mining Company, who are working it day and night, the men living on the ground.

The Tows is further west and a little south of the Leavenworth, in the mouth of Missouri Gulch in fact. It has been opened for 200 yards by three adits, everywhere showing three feet of vein matter, in lower adit small quantity of argentiferous galena, assays \$1,600 a ton, silver; in upper adit two veins of galena 30 inches apart, six inches in the aggregate, assays from \$600 to \$1,000. Being opened by the B. & T. M. Co.

The Omaha lies west of North Clear Creek on the same course two miles from the Leavenworth, traceable by the blossom half a mile, has been struck and exposed along for 600 yards. Discovery shaft is 12 feet deep, no walls yet defined, core of vein a foot thick solid flinty quartz everywhere in place, bearing galena; any of the rock sweats silver on exposure to heat. Six ounces smelted in a

*Since the above was written, the vein of nearly pure galena has widened to 2½ feet. Chunks weighing a ton are taken out

bullet ladle cupelled 30 cents in silver, and the slag was left covered with silver pimples. Prof. Hill assayed a sample which went 300 ounces to the ton. Fifty rods west of discovery a shaft has been sunk 15 feet, crevice three feet wide, solid quartz 12 inches. This leader of the lode is also exposed in a dozen gopher holes between the two shafts. No lode which shows so uniformly for such a distance can be other than a true fissure vein of great power.

The Leavenworth, Tows, and Omaha belong to the B. & T. M. Co., who are opening all of them as well as two other lodes near Chimney Rock in Chase Gulch, the Black Quartz and Ranney. On the last two their shafts are more than 100 feet from the surface and sinking. Mr. Belden went East some year or so ago and raised a liberal working capital against an immense amount of mining property acquired and held by himself and Mr. Tennel in all parts of Colorado. This they are using prudently in the most thorough prospecting. It is to be hoped on every account that they will succeed and their example be generally imitated.

THE COPPER LODES.

About five miles northeast of Black Hawk, in a low and comparatively smooth amphitheater formed by the fan-like affluents of Ralston Creek, occur a group of copper lodes, bearing south a few degrees east as near as I could judge—almost precisely at a right angle with the gold lodes of Gregory. One, called the Arizona, crops out occasionally for half a mile in length, and perhaps 200 feet in width. Four or five shafts have been started on it in different places, in every case showing a solid ledge of flinty quartz *in place*, from 12 to 18 inches wide, accompanied on each side to the full width of a common shaft and how much further no one knows, with vein matter. In speaking of the outcrop I do not mean to say there is a solid ledge 200 feet wide, but that for that space these hard quartz leaders are occasionally found, and scattered over it are huge blossom rocks with a good deal of copper, chiefly in the form of gray sulphuret, mixed pretty thoroughly with their substance.

Half a mile south of the shaft on the Arizona, which is 30 feet deep, is another of about the same depth on

what is called the Sturdevant. It follows a strong leader vertically, and ten feet distant on either hand there is another pitching rapidly toward the main lode. They must come together within 100 feet of the surface, and make a vein of ore from 4 to 6 feet thick at least. But the workings are as yet so slight on this ledge that no idea can be formed of its power or lineal extent. The gangue is white flinty quartz, carrying a heavy percentage of copper in the form of sulphurets, oxyds, carbonates, &c.

At the Buckeye Ranch a hole in sight from the road exposes a ledge in place two feet in width, quartz, bearing minerals of copper and galena, not named nor recorded. A mile north of this is the Abbott, shaft 33 feet deep, gangue country-rock, bears copper, galena, and iron, assays fairly, solid leader of vein a foot thick. The Copperhead and Swansea are similar to the Abbott, not so much developed.

But there are two lodes about half way between the Four-Mile House and the Seven-Mile Mountain, or rather one lode going under two names—Ohio and Tennessee—which really promises well. The shaft on the Ohio is 40 feet deep, good hanging wall, pitches east one foot in ten, loose crevice of white flinty quartz bearing gold copper and galena five feet in width, vein of dark copper ore 6 to 12 inches wide coming in on each wall in bottom of shaft. Four hundred yards north is the discovery shaft of the Tennessee, 30 feet deep, strength and underlie of crevice the same as in the Ohio shaft, and much more minerals of copper, sulphurets, carbonates, and oxyds, in proportion. I think there can be no question that there is a solid vein of very rich copper ore two or three feet in width and at least 600 yards long, right here, and at no great depth from the surface.

There are no other mines of consequence known to exist in the vicinity, there is plenty of wood and water near by, and a wagon can be loaded with ore at the shaft and driven to Denver or Golden City, on a down grade. With a railroad from Golden City to the States, this great wealth of copper, together with untold quantities more known to be housed in the Foothills, will be available. The ore can be crushed and concentrated on the ground and shipped to the States by rail, leaving a large margin for profit. It is not so very far in the future either.

XVI.

QUARTZ MINING IN GILPIN COUNTY.

CENTRAL CITY, NOVEMBER 15, 1867

The depression of Colorado mining stocks in the East is no criterion by which to judge of the condition of the mines. Stocks were perhaps never at a greater discount, and the mines, under all the circumstances, were never doing better. True, a good many are lying idle, from various causes, among which the chief is the universal expectation of lower prices on the completion of railroads across the Plains, and also of the elimination, soon, of an adequate metallurgical treatment.

MINING.

We cannot say much in favor of the present system, or rather want of system in mining. Every mine in the Territory is being worked, if at all, to great disadvantage because not properly opened. This is generally understood by managers on the ground, but the necessities of companies, their lack of means, (if happily they are free of debt), compel them to pursue the rushing process. Ore must be mined and money obtained at once, even if it cost 100 per cent. more than it ought to. It should never be forgotten that the rock broken in *opening* a mine costs five times as much per fathom, as that afterward mined. It requires time, too. A shaft cannot be sunk more than three ten-fathom lifts in a year. During this expensive work, the surface improvements are usually being made—hoisting and draining machinery and mill purchased and erected—and the outlay is heavy and long-continued. Experienced mining men are patient under all this. They know better than to kill the goose that lays the golden egg—than to expect a crop without plowing and sowing. Such are not the majority of Colorado mine owners. Hence they give their agents at the mines no time for preparation, and the consequence is, undue expense in mining, and when the vein becomes pinched or barren, or some accident happens that takes time and trouble to repair, the mine ceases to pay its way, and is allowed to

rest and fill with water, rotting the walls and stulls and injuring the reputation of the country.

A mine should always be opened two lifts ahead, so that the mills may never run short of ore, so that poor ground may be left standing to support the walls, and so that all the rock may be broken by back stoping. Opened thus, supplied with adequate power and machinery for hoisting and draining, there is not so much risk in mining on the Gregory and lodes of its class as there is in coal or iron mining in the East. Because gold always bears the same value; whereas coal and iron fluctuate in price, the latter particularly often ranging so low as to lay up the blast furnaces and rolling mills. But worked from hand to mouth, hogged out, half drained, no ground opened ahead, delayed by frequent breakages of inefficient machinery, everything "down at heel," there is no profit in it, and in case of accident there is absolute loss. There is too much of the latter style of mining in Colorado, and hence the cost per ton of ore mined is twice what it should be—from \$5 to \$8.

* The comparative advantages of the two systems of mining are well shown on the Pacific coast. The chief mines of Nevada County, each producing an average of less than ten tons of ore per day, average value, \$34 per ton, under the private ownership system, with honest management, low expense, and because attempts are not made to force the yield for its influence on the market price of shares, return continuous, handsome profits, and are held in high estimation, regarded as second only to real estate in San Francisco if indeed they are to that, as a permanent investment. On the other hand, the Gould & Curry, for six years and a half producing 100 tons of ore per day, worth \$59 a ton, on account of the "Cyclopean ravaging" necessary in order to keep up its fictitious market value, is looked upon with distrust, varies in price from \$600 to \$6000 a foot. The stockholders are always in suspense. The stock is up one day, down the next, the expected dividend is paid one month, passed another. So that it seems the profits of mining do not consist so much in the richness of the ore and the quantity obtained, as in the way it is done, in the management. It is time the Colorado companies took serious note of this matter.

TREATMENT.

As to processes, the public are fast settling down into the belief that smelting into regulus for the rich copper ores, and stamps for the common pay-rock carrying less than 20 per cent. of iron pyrites, are all that is necessary. Prof. Hill is about to start his Swansea matting furnace, having bought a good deal of ore and tailings, paying a certain percentage of their assay value in cash. On the Fisk, Bates, Gregory and Burroughs, the ore he purchases doesn't constitute one-tenth of that taken out and reduced. Of the Bobtail he uses a large proportion. His furnace has a capacity of eight tons per day, and if it works well, others will be added to it as the supply of copper ores shall warrant. All the companies that are at work are saving five to ten per cent. of their best ore with the view of selling it to him. The balance is run through stamps with more or less profit according to its quality. Messrs. Cheney & Hill, of Lake Gulch, for the Bobtail Company, haul and crush material that is 90 per cent. rock, for \$7 a ton. With a 12 stamp mill, two hands, one on day and one on night shift, wages \$2.75 per day and board, wood at \$7 a cord, they crush 35 tons a week, clearing \$2 per ton. Their stamps weigh 450 lbs. each, and they think them as heavy as desirable, because they crush as fast as screens of the proper fineness will deliver the ore. This mill has been owned and run by the same men for seven years, during which period, under many disadvantages, it has made a living for them, kept itself in shape, and cleared \$32,000.

Of other processes, we are inclined to give the palm to the Monnier. It saves the silver, gold, and copper, at a cost for treatment of \$15 a ton. The Philadelphia Company, which began an experiment with it on 50 tons of ore, last winter, have since had their agent, Wm. Main, Jr., complete it. The ore was picked up from different lodes, none of it was choice, part of it was tailings, yet Mr. Main cleaned up 1900 lbs. of copper from it. He has been trying different appliances for amalgamating (after lixiviating), succeeding best by grinding in an arastra and amalgamating in a barrel, saving 95 per cent in that way. Very few of our ores that are worth working at all do not

contain \$15 worth of copper per ton, which pays the expense of treatment by the Monnier process, according to Mr. Main, leaving the bullion clear profit.

The California process has attracted much attention during the season, and at one time excited high hopes. It consists in roasting the ore in a slowly revolving cylinder lined with brick and having a diaphragm inside it which operates as the cylinder revolves to carry the ore from one end to the other. It has made some excellent mill runs, getting \$57 a ton from 15 tons of second-class, and \$76 a ton from an equal amount of first-class Gregory ore. Its owners claim that it saves from 75 to 85 per cent. of the gold, at a cost of \$8 to \$12 a ton. But aside from the fact that the public no longer take much interest in a treatment that contemplates saving at best only one of the valuable metals in the ore, the owners of the California process, although in operation nearly a year, have failed to demonstrate to general satisfaction the truth of their published representations. Their process is patented and they demand \$10,000 for the right to use it, and \$30 a ton for reducing costs.

The Live Yankee furnace, an invention of the past summer, is claimed to be an improvement on the Bruckner furnace, last above described. Its owners are endeavoring to start it on a working scale at Georgetown, where the ores are rich enough to justify roasting. They think it questionable whether roasting is an advantage, considering the additional expense, on the pay-rock or copper ores of Gilpin County. Not but that it might be on some, only not generally. The ores vary in character so widely not only in different lodes but at different places and depths in the same lode, that it would seem the best treatment in each particular case can only be arrived at by long and careful experiment. The owners of the Live Yankee furnace propose to introduce it where there can be no possible question as to its adaptation and success.

A solution of the problem of treating our ores need not be looked for while every mine owner is endeavoring to adapt some method specially to his own ores. For, as they may be divided into two or three classes, and in sinking may change altogether in character, it is plain that a treatment which answers the purpose to-day is liable to fail to-morrow, and vice versa. Mining and the treatment

of ores are separate branches of business. What is wanted is ore reduction works on a large scale, embracing at least ore-dressing or concentration, smelting, chlorination, and amalgamating, to which miners shall take their ores and be paid cash according to their value, and at which the ores shall be assorted and assigned to such treatment as is metallurgically best adapted to them. Such a consummation is devoutly to be wished, and we trust that the nucleus is already established in the matting works of Prof. Hill.

There is one more desulphurizing and amalgamating process on which some hopes are based—that of Mr. Joseph Kenyon, being tried at the Kenyon mill in Black Hawk. The pulverized ore is pressed into 6-lb. bricks, piled up in a plain brick cupola holding five or six tons, and desulphurized in the course of 24 hours. The advantage claimed for this over the cylinders, is, that it is cheaper. The brick furnaces cost but little and last forever, no power is required to run them, and there is no end to their capacity.

The Keith process is still in use at the Keith mill, and had become reasonably successful at the DuBois mill, when the mill caught fire and burned to the ground. It is being rebuilt.

PRODUCTION AND OPERATIONS OF COMPANIES.

The three banks of Central City have bought and shipped \$1,200,000 worth of gold during the year ending Nov. 1, 1867. There are 30 mills and reduction works in operation in Gilpin County. Some details in reference to the leading companies may not be out of place.

The Black Hawk Company, running eighty 800-lb. stamps, have crushed 10,000 tons of rock, 33 per cent. pyrites, from their Gregory mine, during the year, the rock producing 11,797 ounces of gold, which sold for \$275,000. Of this, \$165,000 has gone to pay the expenses, leaving \$90,000 profit. Of this sum \$12,000 has been put into the Bobtail mine, which is now producing ore, but from which no returns have been received; and nearly \$50,000 has been incurred on account of inadequate draining machinery. Mr. Lee estimates the cost of delays and repairs of pump at \$20,000, the extra expense of mining

on account of bad drainage, at \$27,000. In other words, with an adequate pump and by confining operations to the Gregory mine, the profits of the year would have been almost doubled. They are now putting in a 10-inch pump. The pump shaft is 470 feet deep, the mine has a crevice the entire length (300 feet) from two to four feet wide, and is in better shape to supply ore than ever before. It is the intention to run this through stamps as taken out, buddling and saving the tailings, of which the Company have on hand some 3000 tons. The Bobtail ore is being saved for smelting. There are 50 tons on hand, considered worth \$200 a ton.

The Sensitive Company have taken out in the last eighteen months, 6,937 ounces of gold, worth \$155,000, of which amount, \$110,000 has been paid to the stockholders in dividends, showing the expenses to have been \$45,000, less than 30 per cent. of the gross yield. They have run their own 20-stamp water mill nearly all the time, crushing about 60 tons a week, and they have had considerable rock crushed by custom mills, probably about 4000 tons in the eighteen months. They have been pumped to death as well as the B. H. Company.

The Smith & Parmelee Company have run their 25-stamp mill steadily during the last ten months, crushing about 2700 tons of rock, realizing 3,447 ounces of gold, worth \$73,000. They had 15 tons of first-class and 15 tons of second-class ore treated at the California Reduction Works. The first lot yielded \$76 a ton, the second \$57. They are having another lot of ten tons reduced there. The pump shaft is 430 feet deep, the last 30 feet below where the mine has yet been worked. Mr. Belden, the agent, considers the mine in better condition for supplying ore than ever before.

The Ophir Company have been idle two months of the last twelve, putting in an eight-inch pump. Otherwise they have run their 24-stamp mill steadily, crushing about 2500 tons and realizing 2,863 ounces of gold, worth \$63,000. They have saved and sold to the smelters 47 tons of copper ore, 22 tons of blanket tailings assaying 12 ounces of gold per ton, and 46 tons of buddled tailings. The pump shaft is 510 feet deep and shows a fine vein of ore. The pump is worked only half the time, there being

nothing but surface water. The mine is in shape to keep the mill supplied with ore.

The Sterling Company ran their 15-stamp mill up to July, crushing about 35 tons a week, which yielded \$20 a ton. Since that they have been mining, have 600 tons, worth from \$100 to \$200 a ton, at discovery on the Fisk, and 75 as good or better at their Bobtail mine. They intend to sell this to the smelters, and concentrating the leaner rock, sell that also.

Mr. Geo. R. Mitchell, for the Alps and Granada companies, working the Alps and Mackie lodes, has taken out 3,566 ounces of gold, worth \$78,500, with a 12-stamp mill, in the last sixteen months. In that time he has crushed about 2500 tons of rock. The mines are in good shape for this country, although the pay-vein in both shafts and drifts is somewhat pinched at present writing.

The Bobtail Company have done a great deal of work in their mine, sinking through cap, two shafts, each more than 100 feet. About three months ago they commenced running twenty stamps, which were soon increased to thirty, on second-class rock. They have crushed to date about 850 tons, realizing an ounce of gold per ton, sold 52 tons of first-class ore, assaying above \$100 a ton, and have about the same amount still on hand. In the mine they are opening about as much ground as they are breaking, have ore in the bottoms of two shafts, and in a level 100 feet from the bottom of a third. A portion of their mine is drained by the confederate Bobtail pump, and they expect it all to be eventually, since that pump drains No. Eleven, on the Gregory. The hoisting works and arrangements generally for working the mine, are complete.

The Union Co. have been and are running a 20-stamp quartz mill in Chase Gulch crushing about 60 tons and realizing 80 to 100 ounces of gold a week. They have a thousand tons of rock broken in the mine, two-thirds of it pay, and 200 tons of choice ore saved up, which, if not worth \$200 a ton, is not for sale at less. They are preparing to sink their main shaft, and open up two or three new lifts. Their property is on the Bates Lode.

The Susquehanna Company have been mining, simply, during the year, on the German Lode. Their shaft, perfectly timbered, has reached a depth of 200 feet, and they have started a drift west to connect with an air shaft 150

feet distant. The shaft, carried down perpendicularly, is a little off the vein, but it shows well in the drift, copper pyrites, walls $4\frac{1}{2}$ feet apart.

Leopold Klein, sinking a shaft on the lode, west of the Susquehanna Company's mine, is down 230 feet, drift 50 feet long, has two to three feet of copper pyrites, 150 tons first-class, and 200 of second-class ore mined. The lode is very rich in copper.

*The Pewabic Company, on the Pewabic Lode, Russell Gulch, have a shaft sunk 115 feet, crevice from four to eight feet wide, 500 tons of ore mined, 62 tons, reduced at the California Reduction Works, yielded \$30 in gold per ton. They have a pump in the shaft, engine for hoisting, good building, &c.

The Black Hawk, Smith & Parmelee, Sensionerfer, Ophir, Alps and Granada companies have together crushed, in round numbers, 22,500 tons of rock, which has produced 28,700 ounces of gold, about $1\frac{1}{4}$ ounces per ton, worth, with the premium at 40, \$28.00. In the gross yield should be counted at least 6,000 tons of buddled tailings, containing \$20 to \$30 a ton, and a small amount of choice ore, saved for smelting. The cost of mining and milling per ton we cannot get at so closely, but suspect it to range between \$12 and \$15. These companies have run in the aggregate 167 stamps, showing a capacity, with their weight and speed, of 135 tons each a year, not quite half a ton per day.

XVII.

DOUGLAS MOUNTAIN.

CENTRAL CITY, NOVEMBER 18, 1867

A gentleman who has been over the ground hands us the following in reference to Douglas Mountain:

The traveler approaching Georgetown from the east will not fail in being impressed with the bold and picturesque facade presented by the abruptly fractured end of Douglas Mountain. Like a vast and inaccessible fortress she commands the pass, and seems to be charged with the defense of golden Empire on the right, and silver Georgetown to the left. On getting closer, you find yourself in a beauti-

ful flat or valley extending between Griffith and Douglas, the former arborescent with pine, the latter gloomy and frowning with rocks, naked and massive. At the foot of Douglas, one branch of Clear Creek quietly and limpidly finds its way between grassy banks covered too with shady trees whose roots always are athirst for water. Here an embryo town is laid out and named, Junction City. Doubtless the forecast of her enterprising founders has been animated by a prophetic vision of the wealth concealed in the embrace of those frowning rocks, towering so loftily above them. Here, too, the Masonic Fraternity have selected and neatly enclosed a cemetery, which at some future day may add to, whilst partaking of, the beauty and solemn grandeur of its surroundings.

Another branch of Clear Creek flows by the northern base, but neither quietly nor limpidly. This stream is often precipitated over a rocky bottom, and the water is ever turbid from gold washings and the murky discharge of quartz mills. A singular and significant fact this, indicating as it does, the contact of the silver and gold belts, the one claiming the southern slope and the other the northern slope of Douglas. The silver clear stream from Georgetown unites with the turbid yellow golden stream from Empire, a short distance to the east, below and almost within the shadow of that abrupt fortress-like bulkhead of Douglas already noticed.

In a geological point of view, this mountain straddles the trend of the mineral belts which commence northeast of Central City, and extend northwest beyond Georgetown. Viewing Douglas from a high point, like that of Bald Mountain, you have the rich gold fields of which Central City is the center, at your back, and to your right and left, whilst in front, at a distance of some ten miles the massive obtrusion of Douglas completely conceals Georgetown and the silver region immediately around. You observe, too, that the mountain ranges to the left are divided by Clear Creek, both sides of which are noted for numerous lodes of auriferous quartz. These veins are presently found sidling off at Griffith Mountain where silver lodes become prominent, the first indications of which have been found in Elkhorn, northeast of Idaho. These finally take possession of a part of Miller, all of Griffith, the southern slope of Douglas, and then expand-

ing like a fan, making Georgetown the point of divergence, and Griffith, Douglas, and Miller, the handle. Whilst to the right, still standing on Bald Mountain, you will observe the trend of the gold belt, but little interrupted by the obtrusion of silver lodes, advancing southwestward taking in a part of Miller, the northern slope of Douglas, and all of Empire, beyond which, the diverging spread of the silver fan appears

Douglas Mountain, therefore, appears to stand directly in the fissure lines of both formations, and should, theoretically, be traversed by veins containing both metals. These veins must be found on or near the surface or they have dipped beneath her solid foundations. This last theory involves the supposition that Douglas was a squatter of an origin recent to that of her neighbors. But there is no need of conjecture or theory on this point.

Standing on the road, fully a mile from the face of the mountain, the courses of various lodes are distinctly traceable on the surface, distinguishable from the country rock by reason of the different color and decomposed character of the vein matter. On ascending the slope, no easy task unless one is a hardy miner, you have no difficulty in finding many veins of promising characteristics. Among those on the eastern end we may mention the Washoe, Chicago, Andy Johnson, and Keystone, and toward the center, the Merrimac and the Monitor attract attention. Further on towards Democrat Mountain, the Highland, Eveline, Laura, Winchester, Hewitt, and many others have been located. Very few of these lodes have shafts beyond the prospecting depth, a few feet, the Merrimac having the deepest, some twenty feet. The crevice in almost every instance is wide, and on some of the lodes the surface indications of mineral are traceable with the eye for hundreds of feet. This is peculiarly so with the Washoe, the Andy Johnson, the Merrimac, Monitor, and some others. Assays show both gold and silver in the ores of many of the lodes, as already supposed. Considering the number of lodes, the width of crevice, the amount of assay as claimed by owners, the accessibility of wood and water, and the superior location of the mountain for economical mining operations, it is a wonder that no developments of any importance have yet been made. Possibly this may be accounted for because of the almost inaccessible nature

of the slope, and the necessity of resorting to tunneling, which requires more system, permanence and capital, than is generally vouchsafed to prospectors. Only one tunnel has been excavated to any depth, that of the Australia Company, ninety feet.

MISCELLANEOUS ITEMS.

In 1866, Messrs. Hasbrouck & Co. excavated a tunnel 130 feet in length to cut the Richmond Lode, West Argentine, at an acute angle, then to become an adit, running in on the vein. They found the lode to be twelve feet between true "slickenside" walls, about one-fourth of it considered pay, worth perhaps \$100 a ton. For some reason unknown to the writer, they have not prosecuted the work this year.

The silver belt of Gilpin and Clear Creek counties, not only crops out in Summit County, on the heads of Snake River, but after a disappearance of perhaps twenty miles, comes to the surface again on the head of Ten-Mile Creek, a tributary of the Blue coming from the southwest. The Bullion Consolidated Company own nearly all the lodes that crop out on the surface, and they are running a tunnel under Fletcher Mountain, to cut the king lode of the hill, ten feet wide and a mile long, about 300 yards from the place of beginning. It has reached a depth of 390 feet, and is under contract to be finished 110 feet further by next June. They have found some rich galena, chloride and ruby silver in the tunnel. The agent of the Company intends to introduce the drilling machine in use boring the Hoosac tunnel, if practicable, another year. It advances, in its present state, five feet per day, and is being improved by experience.

Mr. Clark writes us from Georgetown, Nov. 10: "The Terrible Lode, situate on Brown Mountain, now has a solid vein of ore upwards of one foot in width, with a space between smooth solid walls of 61 inches. Veins of ore are scattered through this crevice, which, if concentrated, would make a pure vein of ore two feet thick. I made an assay from a sample of ore taken from the bottom of the shaft, and the result was at the rate of \$3185.75 per ton. It was too much to believe and I tried another sample with the same result. Still incredulous, I assayed two

more samples, the lowest giving \$3235.15 per ton. What do you think of it? It has a terrible name, and I think it a terrible lode." We certainly think the assay exceedingly favorable, coming from a 12-inch vein of pure ore sixty feet from the surface. We have seen seams on the surface that assayed that high and higher, but we are not aware that any one considers them much of an indication of the permanent character of the lode. We congratulate Mr. Clark on having what promises to be one of the best silver lodes of the world.

Mr. Whitford writes us from Griffith Mountain, Nov. 12: "The shaft on the Magnet is 20 feet deep, crevice shows 12 inches of galena and sulphuret of silver, assaying between \$800 and \$1000, silver, and about three feet more galena and quartz, would dress down 60 or 70 per cent. The owners have a cabin near the shaft and intend to work it during the winter. Messrs. Melley, Matthews and Jones have started two shafts on the Alice Jones, 100 feet apart. They have built a shaft house on each shaft, have blacksmith shop in one and assay furnace in the other. They have out a fine lot of ore and have packed down a few tons for reduction. This lode is to be opened during the winter. Messrs. Taft and Birdsall are sinking and timbering shaft on the Comet. The crevice still holds about six feet wide, quartz seamed with sulphuret of lead, silver, and copper." These were new discoveries, and promising ones, when we were on Griffith six weeks ago. We are glad to hear that they are turning out well.

Six tons of first class ore from the Equator Lode, (which on page 50 we said was worth \$1000 a ton, a mistake by the way), pulverized for smelting at the G. S. Co.'s works, assayed \$835 in silver per ton.

The following assays are just received from Georgetown: Baxter \$440, Edwena \$400, Lily \$750, Flora McLain \$500, and \$1770, per ton, all in silver.

We close in the words of the Georgetown *Miner* of Nov. 14, 1867: "Capitalists cannot find a more inviting field for profitable investment than our mining region now presents. Our miners are poor and properties can be bought here at rates varying from five to fifty thousand dollars, that in a few years will be worth as many millions, besides being a constant source of profit to their owners."